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ELECTRICAL WEST

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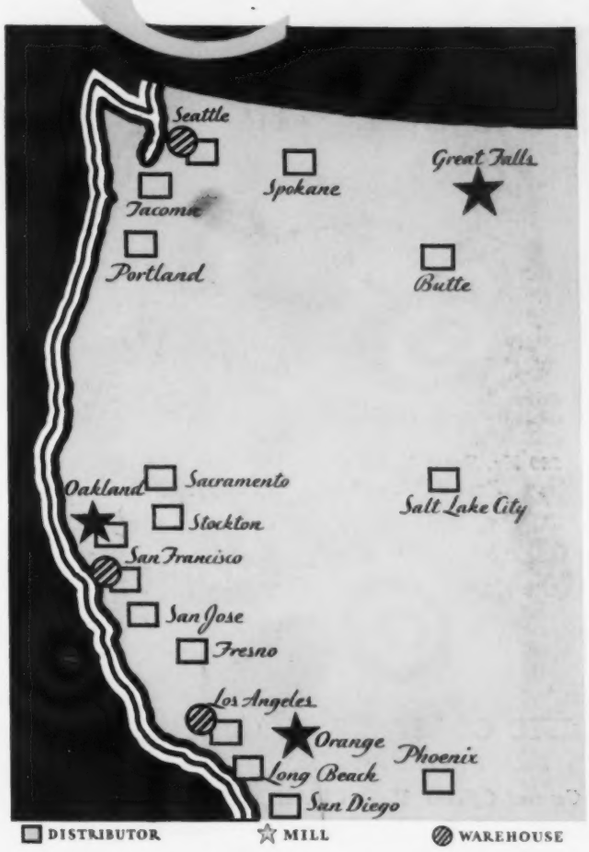

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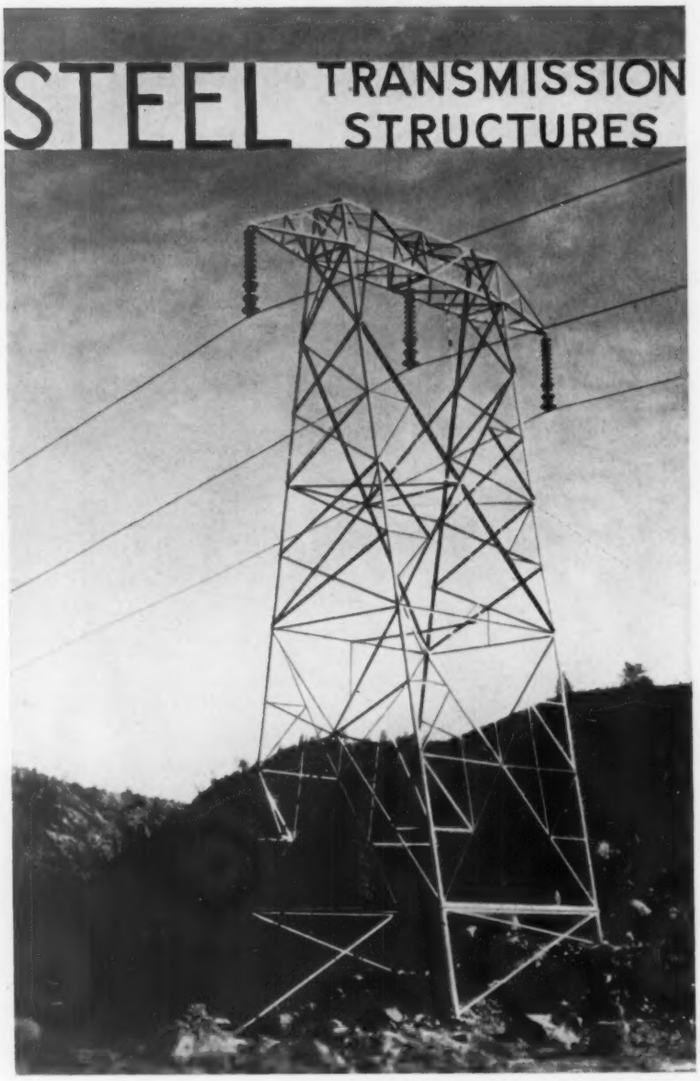

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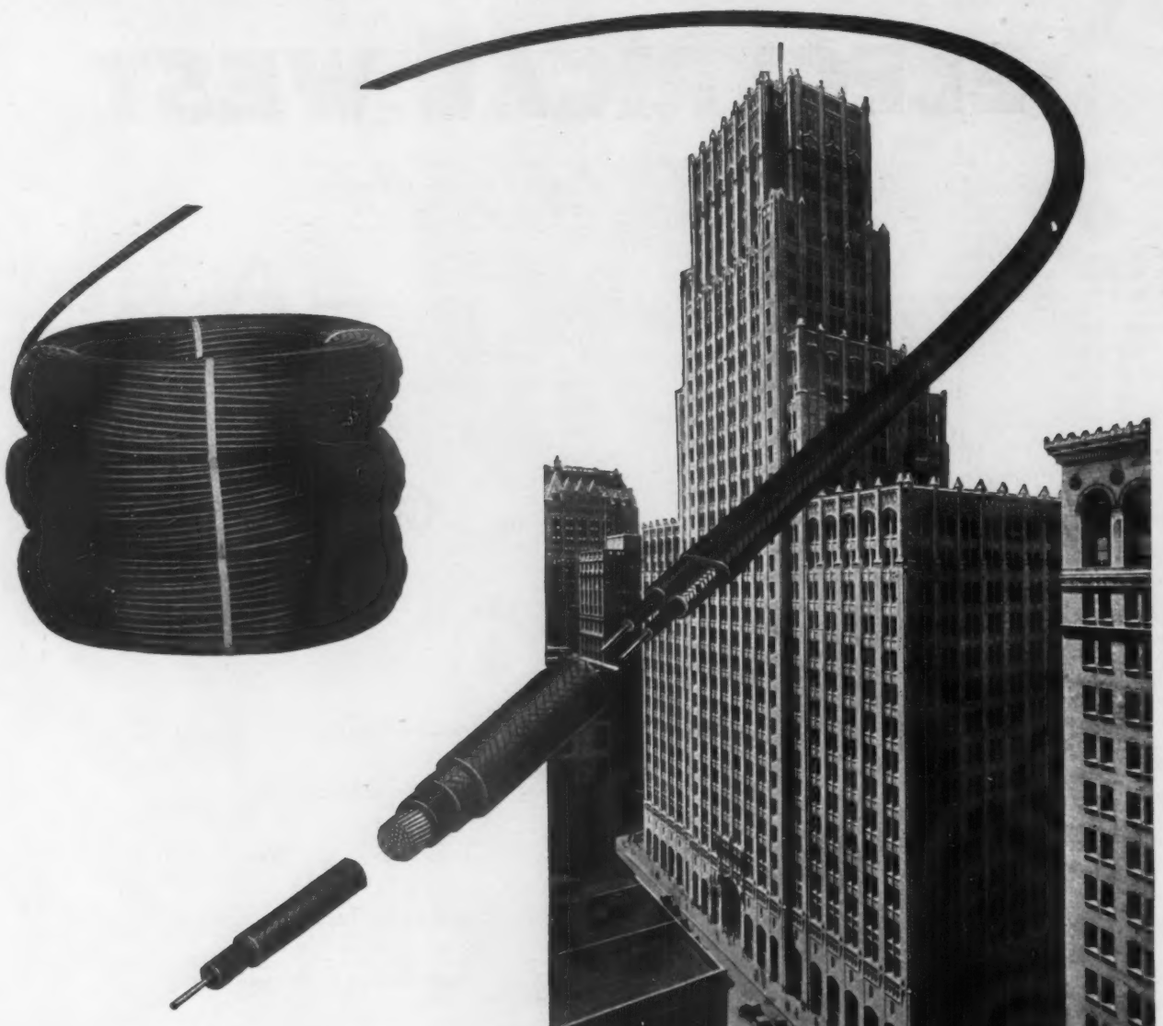

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G. C. TENNEY, *Editor*

Record and Forecast

1930

LARGER than ever before, expenditures of the power companies of the West reached the astounding total of $139,800,000 in 1930. This was some $2,000,000 more than the total budgets. Expenditures for distribution facilities were $58,540,000, nearly four times the amount spent five years ago, 1925, for the same purpose. Slightly larger than 1928 additions, and more than two and one-half times that for 1929, the new generating capacity added in 1930 was 532,300 kva., bringing the eight-year average to 359,936 kva. Thus the industry responded to the President's request that construction work be increased.

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EXCEPT for the new Shuffleton plant of the Puget Sound Power & Light Company, all new steam construction increased capacities of existing plants. Many new hydro-electric plants began generating in 1930, although the total added capacity was less than that for steam. Lack of close-in hydro sites, abundance of fuels, increased steam efficiencies, decreased rainfall, and other economic factors militated against hydro-electric expansion.

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THIRTEEN per cent of the nation's power customers, or 3,211,407, are in the West, but they use 18.3 per cent of all the energy generated in the country, 16,500,000,000 kw.-hr., and pay but 12.5 per cent of the total revenue. This energy comes from 15.2 per cent of the nation's generating capacity, with the steam and hydro percentages about the same as in 1929.

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NINE companies topped the 1,000 kw.-hr. per domestic consumer mark, two of these attaining this average last year. Several others are on the threshold, and all are straining to attain higher domestic consumption. Nineteen-thirty proved beyond a doubt that whatever else happens in industry or commerce, homes continue as the best and steadiest customers for energy.

1931

VERY little decrease from the 1930 budgets is noticed in those for 1931. Of the total, $135,624,531, distribution gets $56,506,000, nearly the same as in 1930 and $500,000 more than in 1929. Transmission systems will get more attention and more of the budget, miscellaneous expenditures will be nearly double those of 1930, and amounts allocated to steam and hydro plants decrease for 1931. Even as actual expenditures in 1930 increased over the budgets, so may those for 1931 if awakened business conditions warrant.

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HYDRO-ELECTRIC construction will play the important role in generation additions, proposed hydro plants totaling nearly twice as many kva. as planned for steam stations. This is a natural outcome of the extensive development in the fuel-burning field in 1930. Proposed additions, 319,568 kva., are considerably less than the 1930 figure, because companies will obtain safe margins in capacity over probable load requirements.

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WITH the splendid growth which the West has had, and the continued influx of population and wealth, the laurels of this section are safe as the most electrically progressive section of the country. Only New York generates more energy than California; at the present rate of growth, California will soon be third in customers served. The West is well above the national average in wired homes.

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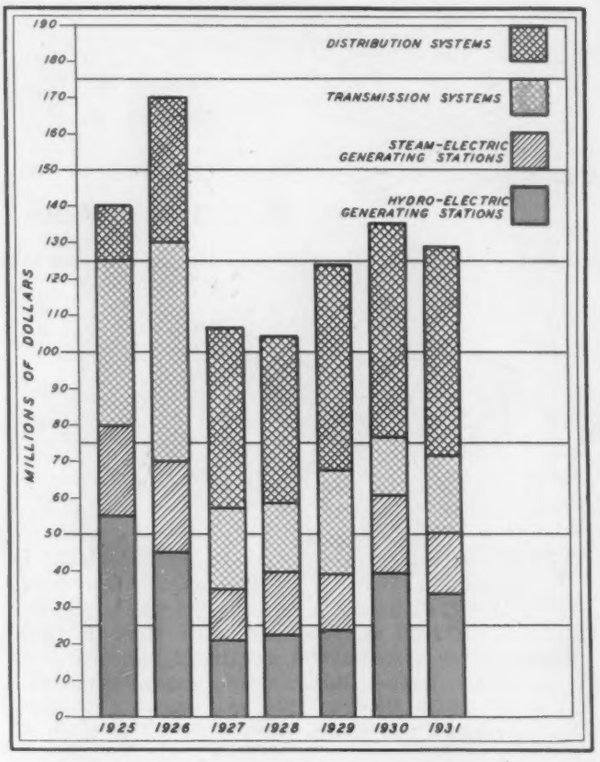
DETERMINED to keep the home heaters burning, appliances working, and domestic load growing to offset industrial power decline, quotas of central stations, dealers, and manufacturers set up an $83,556,000 market for 1931. Commercial men still insist they can sell 50,000 ranges in a year, 25,000 water heaters, 75,000 refrigerators. At least $25,000,000 in table appliances, clocks, washers, ironers, cleaners and health appliances will be sold by dealers and merchandising central stations.



Distribution will take the lion's share of 1931 construction budgets. New transmission lines will exceed last year's. Steam having had its inning in 1930, hydro construction will predominate this year

SOME 40,000 ranges were added to lines last year. Quotas were set for 50,000, based on 1929 sales of 47,000 units. Even this accomplishment was no mean feat in the face of natural gas expansion and business contraction. Quotas for 1931 reflect courage and faith in the merits of electric cookery. Water heater sales, while not meeting 24,000 quota expectations, held up to 16,000 units.

▼ ▼ ▼

CO-OPERATIVE merchandising gained many converts in 1930. Mergers rumored a year ago transpired in California and Oregon. There is so little left to merge economically that tendencies in this direction seem to be halted, temporarily at least. Rate reductions were few and unimportant, mostly in domestic top blocks. Until revenues grow larger from more uses the downward trend of rates may rest awhile.

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BOULDER Dam became Hoover Dam and something more of a reality. Despite Arizona's unremitting protests and suits, a railroad branch line was started across the desert to the site, Southern Sierras Power Company is building a line to feed construction works, and plans are being made to begin this new labor of Hercules in the spring.

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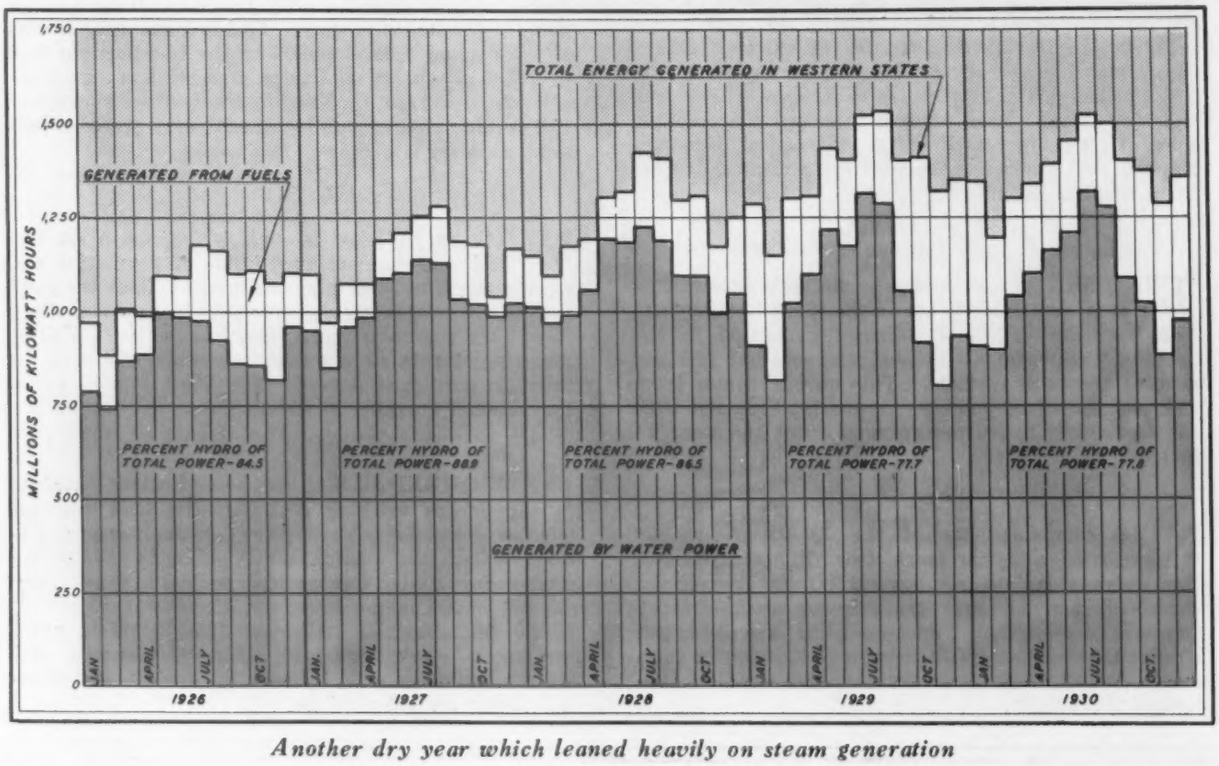
ELECTIONS reflected the public's bewildered, straw-clutching efforts to escape business depression. Politicians pointed fingers at a mythical "power trust," said "Boo!," and voters struck at an imaginary foe. The Northwest awoke to find two district power bills passed and rumblings of various contemplated projects. California and Arizona voters reacted differently, felt thrifty on bond issues, granted franchises to private companies.



Another dry year which leaned heavily on steam generation

1931 (Contd.)

DEALERS in appliances will receive more help, more advertising, more business through central station advertising and promotional efforts this year than ever before. The two-salesmen-are-better-than-one idea gained ground, convinced many commercial men of its necessity last year.

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WITH several years' accumulated experience, advertising and field work behind them, electrical leagues and bureaus face 1931 with unaltered budgets, some increased in fact. Red Seal homes, Franklin and Red Seal commercial lighting, and other promotional activities will stir up stagnant wiring and supply business, make markets for fixtures and appliances.

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PUBLIC ownership plans many minor, some major assaults in 1931. It will hold its convention in Los Angeles, seek to organize state organizations, convince politicians that there is a "power issue." Where lowest rates in the nation prevail it has been hard to convince householders they are being abused, but in depression Utopians hope for better luck.

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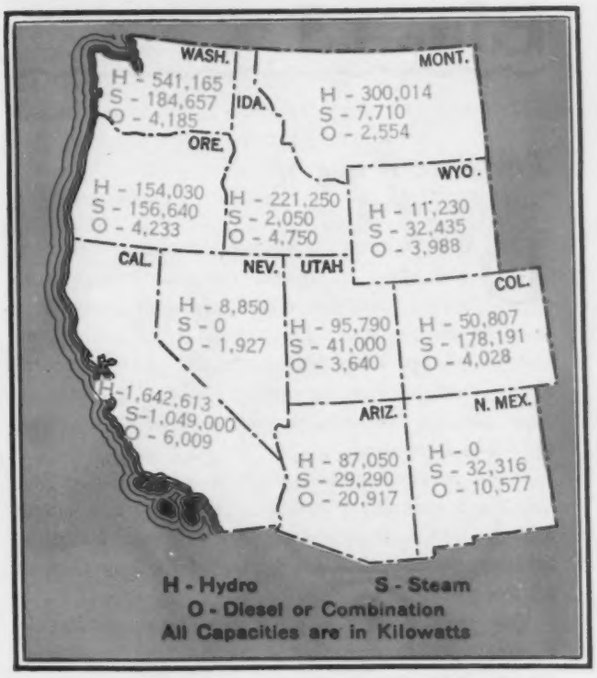
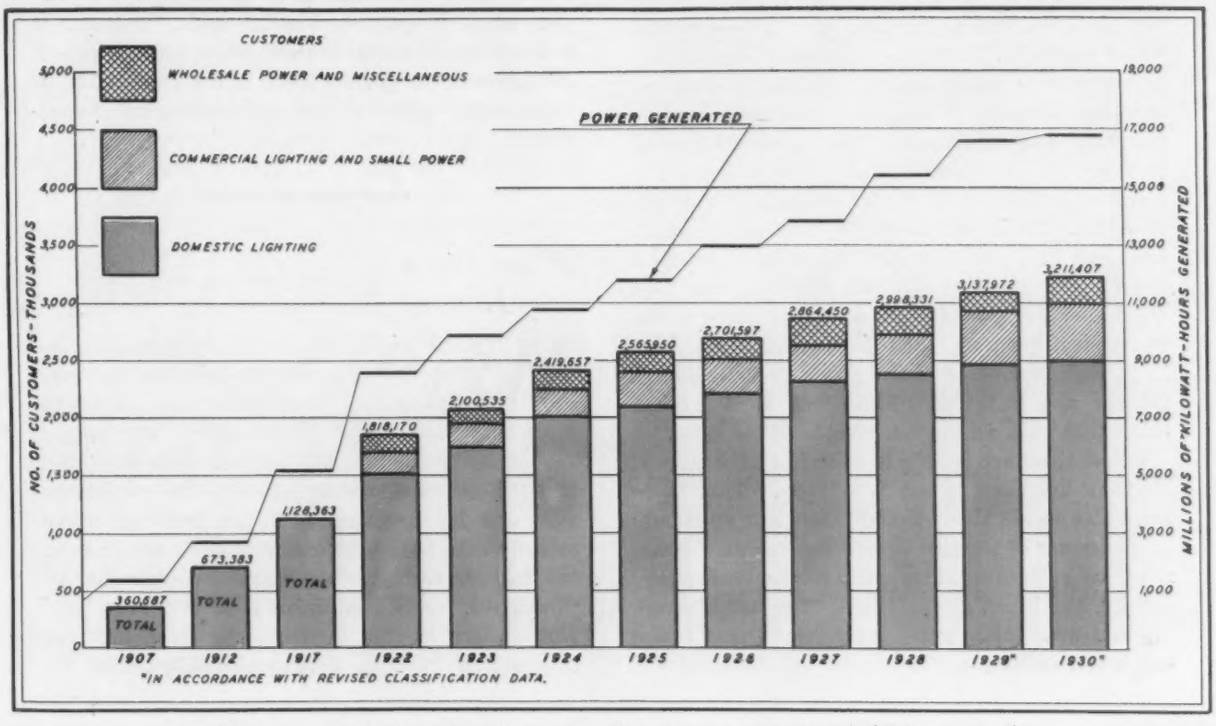
MUDDIED waters of the Colorado are yet unsettled, despite work started towards construction of Boulder settling basin. This moral achievement has heartened the advocates of public power to stir up the waters of the Columbia for like results. Despite stirrings, Flathead project is to be built by Montana Power Company; Stone & Webster are throwing the first barrier across a deviation of the Columbia at Rock Island. All other projects on the Colorado seem indefinitely tangled in Washington tape, while upper basin states move to protect their future rights. Mexico retains a dark eyed, watchful silence. The larger the river, the greater its problems.



Installed capacity in steam grew fastest in 1930. (See last year's chart.) Diesel capacity increased, particularly in southern states. Hydro was satisfied, in a low rainfall year, to hold its own. All capacities increased, however



Customers continued to increase, therefore generation held its ground

Editorial

The Sine Wave of Building

DURING the past ten years building construction has completed one continuous sine wave, from depression, through prosperity, back to depression. The curve is as smooth as though plotted by a Steinmetz for the characteristics of an alternating current. That it seems to have reached the bottom node and be on its way up again is evident.

Stock market curves are not so smooth. The tension accumulates until a sudden crack opens and the whole structure tumbles at once. Building activity, on the other hand, started its long sloping off five years ago.

The very diversion of money into speculative channels which contributed to the "joy ride" and its smash-up, was felt at once in building construction. The further it progressed the worse it became for building. And so, while boom times seemingly existed, measured by stock market figures, to the electrical contractor the prosperity varied inversely as the square of the market. Only the rapid demand for more uses of current and electrically driven devices has presented any opposition to the past five years' decline in building.

Unfortunately the last prosperity in the construction industry was a profitless one. The optimism which makes for good times created an opportunity on the part of manufacturers and distributors for the establishment of too many outlets for wiring materials and appliances. Mass production tried to force an uneconomic mass distribution. The result was injury to the better elements of that distribution. Those who knew the business, its needs and costs, and possessed standing in the community and some modicum of salesmanship were sacrificed to the new god, volume. Profit was trimmed to the well-known imaginary line dividing cost and overhead, each succeeding shaving leaving the industry thinner and hungrier. Altogether it is a good thing that such an era has completed its cycle.

Better times are coming in electrical construction. Perhaps the word to use is activity. That is as inevitable as the tide. Better times will come only if the lessons of the past decade are heeded. Volume must be subordinated to completeness—adequacy, quality, and by all means, profit. The manufacturing and wholesalers group must realize that fewer and better outlets, well supervised and directed, will make more profitable markets for their wares. Responsibility, both in business ethics and in finance, and knowledge of the craft must be sought in combination with the priceless ingredient, salesmanship.

As the year 1931 begins there is a more healthy and sympathetic mental attitude between the interdependent branches of the industry than has existed for some time. Chastened by the weathering of a "hard times" together, labor and contractor, jobber and manufacturer, and central station should prepare for the profitable era which is to be found around this turn of the road.

The Value Of Statistics

SOMEONE has jokingly referred to 1930 as "a year of overprediction." In fact this quip has met with such favor that it places in disrepute any statement that pretends to predict future outlook. Nevertheless, only one conclusion can be reached after a review of the statistical studies and analyses presented in this issue. It is that the electrical industry of the eleven Western states is faced with a particularly bright future.

Facts, experiences, and opinions set down on other pages furnish for any man in the industry ample material on which to base a prophecy or prediction of his own. Few agencies within the industry are in a position to collect and correlate the data which are presented in this issue. The editors dedicate this material to those whose knowledge and background will permit them to use these facts in formulating policies and in discounting future trends.

What Price Leagues?

WHILE engaged in necessary periodical inventories of itself, the electrical industry often asks: "Are these leagues worth their board and keep? What are we getting for our money?" In fact the leagues themselves feel that if these questions are not asked their existence may well be threatened. To an industry which actually asks such questions and seeks the answer, the leagues can give an excellent accounting of themselves. Only indfference is to be feared.

Elsewhere in this issue reports from the four outstanding business development leagues of the

West are published. These are from Utah, Colorado, British Columbia, and California. In each case the record is excellent. In all respects every branch of the industry has benefited from them.

Mere existence of a third and neutral party on which the public may rely for sound advice as to its electrical needs justifies a league, if nothing else. When such leagues act as stimulators of sluggish markets, discoverers of new prospects, consulting home engineers, lighting and decoration campaign sponsors, and besides act as the forum for the settlement of internal differences of opinion and controversy in the industry, their existence is no longer a matter of desirability but one of absolute necessity. Let there be more of them.

Reducing It to Something Simple

HEAT of argument usually generates so much byproduct smoke that the clear-cut issues become fogged or completely concealed. At least the heat itself distorts the atmosphere in such a way as to produce mirages of one kind or another. The much stewed-over subject of power company merchandising often gets into that state. In the interests of sanity, if nothing more, the smoke should be cleared and the real problem be looked at coldly, searchingly.

When the fires are put out and the raw light of reality is turned on this situation called merchandising, a few simple, direct, basic things stand out. In words of as few syllables as possible these are:

Power companies must and will continue to build load. If it takes direct merchandising to do it, they must merchandise, ethically and legitimately.

If they stop to think about it, dealers do not want central stations to stop promoting the business. It would hurt dealer business more than is realized.

From purely selfish reasons, power companies cannot afford to allow competitive practices which will hurt or reduce dealer sales. If it takes a different type of supervision of salesmen or a change of compensation plan, it will pay the companies to find out what is needed and put it into effect. When the head office says co-operation, it should mean exactly that to the salesman. The plan he works under should not be such that it will strain his honesty or imperil his subsistence if a dealer makes a sale.

If special inducement seems to be necessary to coax along sales on special lines, it would be foolish not to extend the privileges of terms or premiums to dealers who are willing to help do the job, even if it involves some little trouble to do so.

Because many of the root causes of misunderstanding lie buried in manufacturers' policies or wholesale distribution, the surface irritations are not the only things that should be smoothed out. These deep-moving undercurrents will ruffle the surface again and again until corrected.

There must be more seeing of the problem from the other man's viewpoint, and that may be said for all the industry. Vilification on the one side is not more excusable than "shushing" on the other. Neither gets results. False prophets, cranks with an axe to grind, and professional martyrs will develop only bad cases of self pity in those who listen to them. "Soft peddlers," on the other hand, only make themselves ridiculous.

After all, it is the customer who must be served. Any group of clerks behind a counter engaging in a heated argument as to who is to serve a customer would be silly. They would drive that potential buyer out of the store to spend his dollar elsewhere. In the interests of its customers—the public awaiting the further use of electricity for comfort, labor saving, beauty, and better living—the industry must straighten out its sales force behind the counter and keep the purchase in its store.

A Year for Teamwork

IN DEVELOPING a greater and more widespread use of electrical service and electrical equipment, the power companies, manufacturers, wholesalers, contractors, and dealers have one interest in common—electricity. It is the tie that binds these groups into an industry. The year 1931 finds the industry as a whole, and each of its integral parts individually, faced with the common problem of building more business. Individually and collectively, the groups that comprise the industry must marshal their forces for a business drive in competition with every other industry that is seeking the consumer's dollar.

If the efforts to establish electricity in the market-place are to meet with success, each branch of the industry should assume its proportionate share of responsibility. The problem is one of selling the public. Successful selling requires good salesmen, ample sales promotion. In the case of the electrical industry, there is one more necessity—teamwork. With properly balanced proportions of each of these three, any sales job, from an adequate wiring installation in a home to complete electrification of the largest industrial plant, can be done.

West Progresses Electrically During 1930

With Only 9.6 Per Cent of the Population of the Nation, the Eleven Western States Have 13 Per Cent of the Customers, 15.2 Per Cent of the Generating Capacity, and Produce 18.3 Per Cent of the Total Energy. Growth During 1930 Was Not Seriously Affected

MODERN civilization as typified by the United States is based upon the assumption of an adequate supply of electrical energy. Industry, commerce, transportation, communication, pleasure, and to a lesser degree, agriculture, are today dependent upon the network of electrical plants and lines that makes electric service available in city, hamlet, and farm. Only a cataclysmic revolution can change this condition.

What, then, has been the effect of the cyclical economic disturbance of 1930 upon the operations of the electric light and power companies of the Far Western states? Energy generation held its own, in fact showed an increase of a fraction of a per cent in the face of a national decrease of 1.5 per cent. Gross revenue increased 2.7 per cent and customers 2.3 per cent. Nineteen hundred thirty will only put a slight nick in the curve of steady growth that has marked the West as one of the most highly electrified and rapidly growing regions of the nation.

Public utility plants in this territory produced 16,549,465,000 kw.-hr. in 1930 as compared with 16,532,833,000 kw.-hr. in 1929. Western production represented 17.8 per cent of the national total in 1929 and 18.35 per cent in 1930, the increase being attributable to the dropping off of more than a billion kilowatt-hours in national production last year, while generation in this region showed a slight increase. Energy generated in hydro plants was 12,881,227,000 kw.-hr., or 77.5 per cent of the total produced, practically the same ratio that held for 1929. Water shortage in the Pacific Northwest was almost as severe last summer and fall as in 1928, and this is responsible for the deficit in hydro-electric generation. At the present rate of growth this region will soon be producing half of the national total hydro-electric power. In 1930 the percentage rose to 41.2 from 37.1 in 1929.

Steam production was 3,668,238,000 kw.-hr. in 1930, or only 6.23 per cent of the total for the United States. A relatively small percentage of the steam production came from coal burning stations. This region depends largely upon natural gas and oil for fuel. The drop of 751,000 bbl. in oil consumption and 53,000 tons in coal consumption was offset by an increase of 669,000,000 cu.ft. in natural gas consumption. Natural gas is or shortly will be available as a fuel for practically every important steam-electric generating plant in California. Lines from Kettleman Hills to the San Francisco Bay region were completed during 1930 and a line is now under construction from the Los Angeles fields to San Diego.

Additions to generating capacity in the Far West for the year totaled 532,300 kva., the largest increase in any one year in the history of the industry. Steam plants, with 276,500 kva., comprised more than half of the total, and exceeded hydro for the second consecutive year. Generating capacity in the eleven Western states is now 4,835,456 kw., which is 15.2 per cent of the total for the nation. Hydro plants total 3,012,161 kw. and steam

Table I—Central Station Operation in 11 Western States, 1929 and 1930

Item	11 Western States		United States		Per cent 11 Western States to Total of U. S.
	1929	1930*	1929	1930*	1930
Energy Generated (thousands of kw.-hr.)	16,532,833	16,549,465	91,421,000	90,076,000	18.35
Energy Generated by Hydro Plants (thousands of kw.-hr.)	12,859,044	12,881,227	32,390,000	31,194,000	41.20
Energy Generated by Steam Plants (thousands of kw.-hr.)	3,673,789	3,668,238	59,031,000	58,882,000	6.23
Percentage of total energy produced by Hydro	77.8	77.5	35.4	34.6	.....
Coal Consumption by Central Stations (short tons)	703,000	650,000	41,406,000	39,393,000	6.5
Fuel Oil Consumption by Central Stations (bbls.)	3,667,000	2,916,000	9,740,000	8,646,000	33.8
Gas Consumption by Central Stations (thousands of cu. ft.)	27,746,000	28,415,000	112,442,000	121,281,000	23.3
Hydro Generating Capacity (kw.)	2,976,625	3,012,161	7,886,807	7,928,094	38.0
Steam Generating Capacity (kw.)	1,411,221	1,777,511	21,185,668	23,046,220	7.7
Internal Combustion Capacity (kw.)	.....	45,784	.....	404,429	11.3
Gross Revenue from sale of energy	$261,160,000	$268,320,000	$2,105,900,000	$2,155,000,000	12.5
Operating and Maintenance Expenses†	96,300,000	96,200,000	934,900,000	950,700,000	10.1

*Based on ten months operations.
†Do not include interest, taxes, depreciation, or sinking fund charges.

Table II—Energy Generated in Public Utility Plants of 11 Western States, 1921-1931*

State	ENERGY GENERATED (THOUSANDS OF KW.-HR.)									
	1921	1922	1923	1924	1925	1926	1927	1928	1929	1930
California	3,982,938	4,379,703	5,069,314	5,566,440	6,215,813	6,898,620	7,355,548	7,979,837	8,849,622	9,014,634
Oregon	468,534	512,804	594,434	678,394	729,859	831,135	844,654	1,040,743	1,161,386	1,236,863
Washington	1,176,662	1,285,625	1,446,486	1,503,560	1,623,007	1,807,792	2,121,939	2,361,024	2,552,325	2,566,295
Nevada	36,532	39,282	47,048	41,623	39,703	36,840	51,236	54,935	43,840	44,652
Utah	119,551	145,689	272,577	266,946	339,967	349,604	338,067	282,791	402,005	303,196
Arizona	132,434	144,615	157,183	153,196	130,531	172,243	278,559	335,755	283,023	387,601
New Mexico	15,768	17,140	18,268	19,913	21,787	25,993	33,462	52,326	67,179	75,255
Colorado	362,651	413,475	461,570	490,030	522,892	561,962	551,173	541,150	563,813	575,094
Wyoming	37,855	38,985	48,853	53,556	55,544	59,381	66,493	83,931	98,665	103,715
Idaho	550,149	615,783	694,781	792,532	754,079	810,780	806,402	947,709	894,417	906,919
Montana	596,610	984,972	1,138,545	1,145,285	1,262,629	1,407,903	1,394,655	1,619,351	1,613,688	1,335,235

*U. S. G. S. Data.
†December estimated

plants 1,777,511 kw., with national percentages of 38.0 and 7.7. During 1930 Western plants produced 3,425 kw.-hr. per kilowatt of installed capacity, whereas the national figure was 2,821 kw.-hr.

Gross revenue for the year amounted to $268,320,000 as compared with $261,160,000 for 1929. Rate reductions on almost all classes of business were put into effect in various sections of the territory, but these had little effect on the total gross. Such decreases as occurred in revenue from power sales were more than offset by increases in domestic revenue. Experience of the past year has done more than any one thing to prove the stability of domestic load and to justify the load-building activities of the power companies. Operating expenses, exclusive of interest, taxes, depreciation, and sinking fund requirements, decreased from $96,300,000 to $96,200,000 with a consequent decrease in operating ratio.

With only 9.6 per cent of the population of the United States, the eleven Western states have 13 per cent of the total electrical consumers. During the year just closed the number of customers in this region increased 73,435, bringing the total to 3,211,407. The classification of customers includes 2,508,281 domestic, 478,080 commercial lighting and small power, and 225,046 wholesale power and miscellaneous. The Western percentage of wired homes is still considerably higher than the national figure of 70. In the accompanying table of customers, groups have been reclassified and this accounts for apparent decreases for some states.

In customers, generating capacity, and ouput, California heads the list of Western states. With 1,864,529 customers of all classes, this state has 57.2 per cent of the total. It is exceeded only by New York, Pennsylvania, and Illinois in the order named. If California's growth continues it will reach third place within two years, as Illinois has only 1,872,478 consumers at the present time. New York exceeds California only in point of energy produced.

In generation per customer, the Western states head all regions of the country with 5,160 kw.-hr. The national figure is 3,721.

The growth of the Pacific Coast region during the last decade has been astounding. Influx of population, industry, and capital was revealed by the last U. S. Census. Yet only relatively small proportions of the natural resources and potentialities have been developed. Every power need brought about by this growth has been anticipated by the electric light and power companies. Meeting the growth prophesied for the next ten years and at the same time providing adequate power supply for the new applications and new markets for electricity that are developing should result in even greater records than the Western power companies have set up to the present.

Table III—Classification of Central Station Customers Showing Growth in 1930

State	Total Central Station Customers			Domestic Lighting Customers			Commercial Lighting and Small Power Customers			Wholesale Power and Miscellaneous Customers*		
	Jan. 1 1930	Jan. 1 1931	Increase in 1930	Jan. 1 1930	Jan. 1 1931	Increase in 1930	Jan. 1 1930	Jan. 1 1931	Increase in 1930	Jan. 1 1930	Jan. 1 1931	Increase in 1930
California	1,807,354	1,864,529	57,175	1,431,013	1,480,531	49,518	275,862	285,327	9,465	100,479	98,671	—1,808
Oregon	234,679	240,564	5,885	183,488	187,235	3,747	36,373	34,121	—2,252	14,818	19,208	4,390
Washington	443,402	454,702	11,300	335,947	342,030	6,083	60,685	59,673	—1,012	46,770	52,999	6,229
Nevada	17,656	19,986	2,330	13,000	14,314	1,314	2,473	3,098	625	2,183	2,574	391
Utah	118,171	110,655	—7,516	94,296	85,505	—8,791	12,312	13,167	855	11,563	11,983	420
Arizona	68,124	70,677	2,553	55,505	57,524	2,019	10,182	10,998	816	2,437	2,155	—282
New Mexico	32,673	34,780	2,107	26,197	27,180	983	4,814	5,379	565	1,662	2,221	559
Colorado	208,752	211,240	2,488	163,344	164,737	1,393	29,735	31,435	1,700	15,673	15,068	—605
Wyoming	34,970	36,354	1,384	28,970	29,761	791	4,813	5,377	564	1,187	1,216	29
Idaho	85,005	83,098	—1,907	54,063	53,153	—910	15,886	14,123	—1,763	15,056	15,822	766
Montana	87,186	84,822	—2,364	64,158	66,311	2,153	19,766	15,382	—4,384	3,262	3,129	—133
11 Western States	3,137,972	3,211,407	73,435	2,449,981	2,508,281	58,300	472,901	478,080	5,179	215,090	225,046	9,956
Total United States	24,147,183	24,701,972	554,789	19,967,154	20,438,774	471,620	3,598,115	3,663,946	65,831	581,914	599,252	17,338

*Because of reclassification, the data on wholesale customers, and to a less degree on retail customers, is not comparable with statistics in similar tables previously published. Reclassification also accounts for the apparent shrinkages or abnormally small gains reported by certain companies and reflected in state totals.

New Construction Budget for 1931 Is $135,624,531

Power Companies of Western States Will Spend $135,624,531 for New Facilities This Year as Compared with $139,800,000 in 1930. Distribution Will Require $56,506,000, Hydro $33,296,000, Transmission $21,332,000, and Steam $17,037,000

POWER companies of the eleven Western states have budgeted $135,624,531 for additions to plants and equipment for 1931. Budgets reported are only 1.5 per cent less than those set up at the beginning of 1930 and are 3 per cent less than actual expenditures for last year. Despite recessions in general business and industry, the electric utilities of this territory spent approximately $2,000,000 more for new construction during 1930 than called for in estimates at the beginning of the year. Such factors as the desire to conform to the promises made to President Hoover and low prices for money, equipment, and materials contributed to this better than normal program.

New distribution facilities head the list of expenditures for 1931 with $56,506,000. Expansion of underground systems, replacing older systems with modern a.c. networks, modernization and strengthening of older distribution lines, construction of new and modern substations, and extension of facilities into more remote districts account in a large measure for the size of the distribution budget. In this area distribution expenditures have mounted from a bare $15,000,000 in 1925 to a $57,000,000 average for each of the three years 1929-31. More than 40 per cent of the total budget has gone into this classification in recent years.

Additions to hydro-electric generating capacity will require expenditures amounting to $33,296,000 during 1931. This is $5,709,000 less than was spent in 1930. Last year was the nearest approach to those two record years of 1925-6 when $100,000,000 was expended on hydro-electric plants. Projects in the Pacific Northwest account for the major portion of this section of the budget.

Strengthening of the network of interconnected transmission lines that blankets the Pacific Coast area from Canada to Mexico in the interests of reliability and freer interchange of power is responsible for the increase in the transmission budget to $21,332,000 from $15,662,000 spent last year. As larger and larger blocks of power are concentrated either in huge steam stations or in some of the major hydro projects and sites that are under construction or under consideration, it is reasonable to expect that transmission expenditures will continue to require this same percentage of the budgets.

The amount set aside in the budgets for steam generating facilities this year is $17,037,000 as compared with actual expenditures totaling $21,794,000 in 1930. Purchase of most of the equipment last year for plants to be completed during 1931 accounts for the decrease. However, several installations of considerable size are in prospect for 1932-33.

The last section of the budget, $7,453,531, is set aside for miscellaneous construction such as buildings, shops, garages, and the like. This amount compares with actual expenditures last year of $4,797,000.

Table I—Valuation of Additions and Extensions to Western Power Systems, 1925-1931

	1925	1926	1927	1928	1929	1930	1931*
Hydro-Electric Generating Stations	$ 55,000,000	$ 45,000,000	$ 21,497,000	$ 22,588,100	$ 23,482,000	$ 39,007,000	$ 33,296,000
Steam-Electric Generating Stations	25,000,000	25,000,000	13,711,000	16,905,700	15,758,000	21,794,000	17,037,000
Transmission Systems	45,300,000	60,000,000	22,121,000	18,575,100	27,902,000	15,662,000	21,332,000
Distribution Systems	15,000,000	40,132,000	49,878,000	45,966,100	56,029,000	58,540,000	56,506,000
Miscellaneous Expenditures†	.....	.....	.....	3,284,000	7,177,000	4,797,040	7,453,531
Total	$140,300,000	$170,132,000	$107,207,000	$107,319,000	$130,348,000	$139,800,040	$135,624,531

*Budget estimate.
†Not included prior to 1928.

Table II—Segregation of Expenditures for Transmission and Generation, 1922-1931

Year	Total Construction Budgets for Year	Total Expenditures for Generating Plants	Total Expenditures for Transmission and Distribution	Per Cent of Total for Generating Plants	Per Cent of Total for Transmission and Distribution
1922	$ 75,986,000	$31,533,000	$ 44,453,000	41.5	58.5
1923	102,662,000	33,092,000	59,570,000	32.2	67.8
1924	109,180,000	51,080,000	58,100,000	46.8	53.2
1925	140,300,000	80,000,000	60,300,000	57.0	43.0
1926	170,132,000	70,000,000	100,132,000	40.9	59.1
1927	107,207,000	35,208,000	71,999,000	32.8	67.2
1928	104,035,000	39,493,800	64,541,200	38.9	61.1
1929	123,171,000	39,240,000	83,931,000	31.8	68.2
1930	135,003,000	60,801,000	74,202,000	45.1	54.9
1931†	128,171,000	50,333,000	77,838,000	39.3	60.7

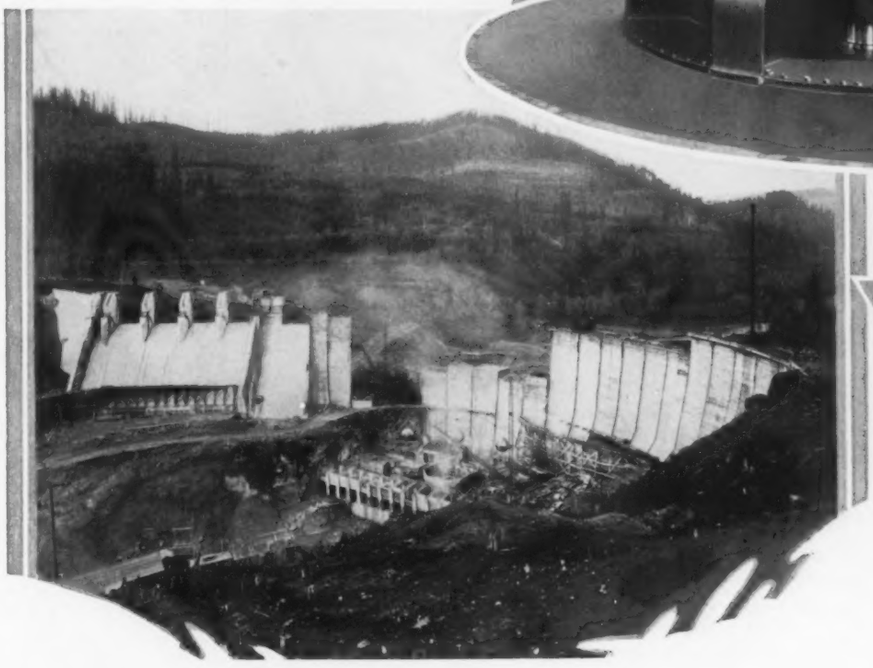
†Budget estimates.

Visualizing Electrical Progress in the West

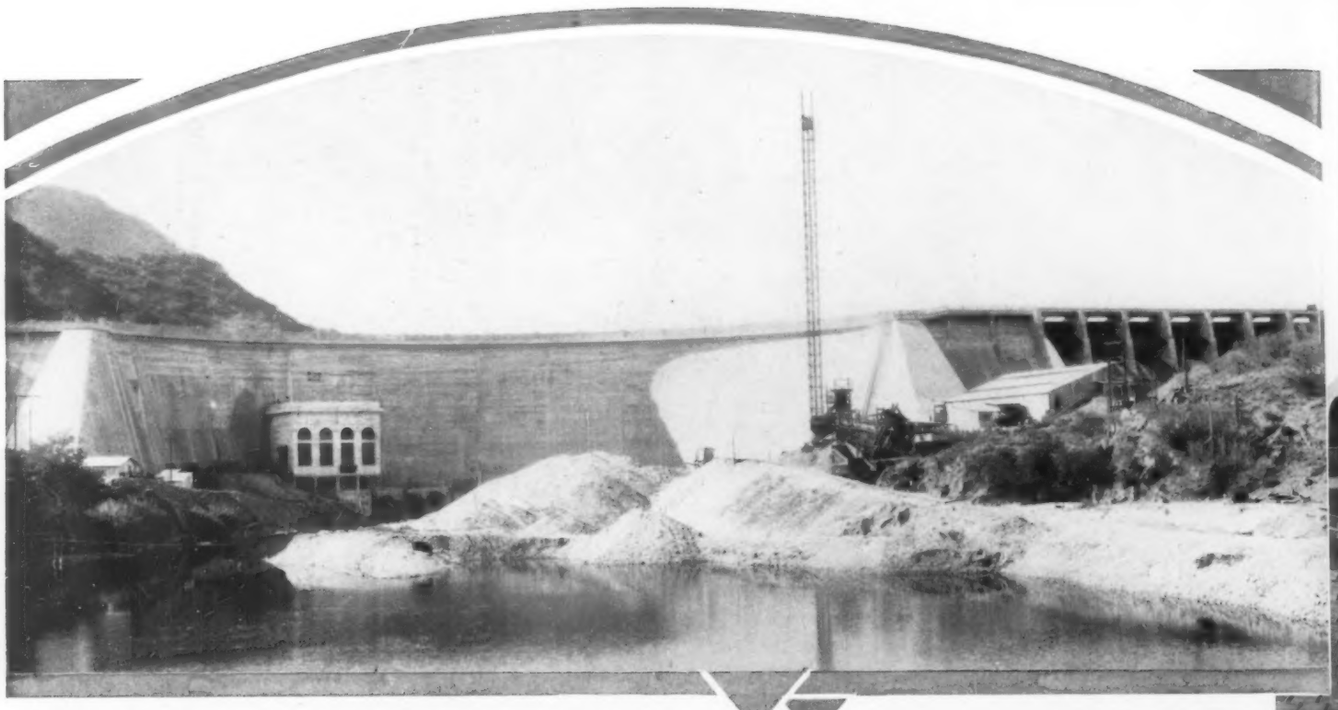
Cushman No. 2 of City of Tacoma converts 104,000 kw. from tailwater of Cushman No. 1

Below: Second 30,000-kva. unit of Portland General Electric Company's Oak Grove plant

Below: Ariel dam of Inland Power and Light Company's 160,000-kva. development on Lewis River nears completion

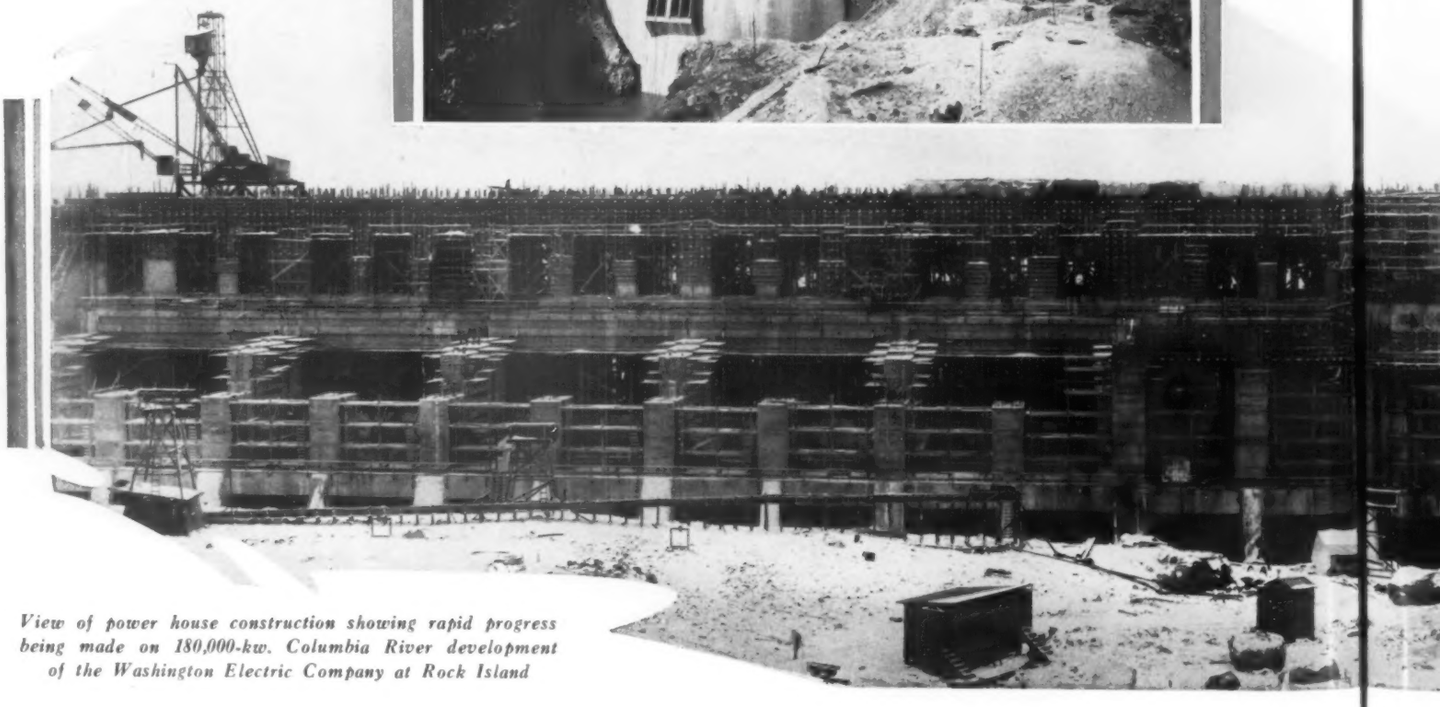


Site on Davis River, Alaska, where 50,000-hp. plant will be built by Portland Canal Power Company

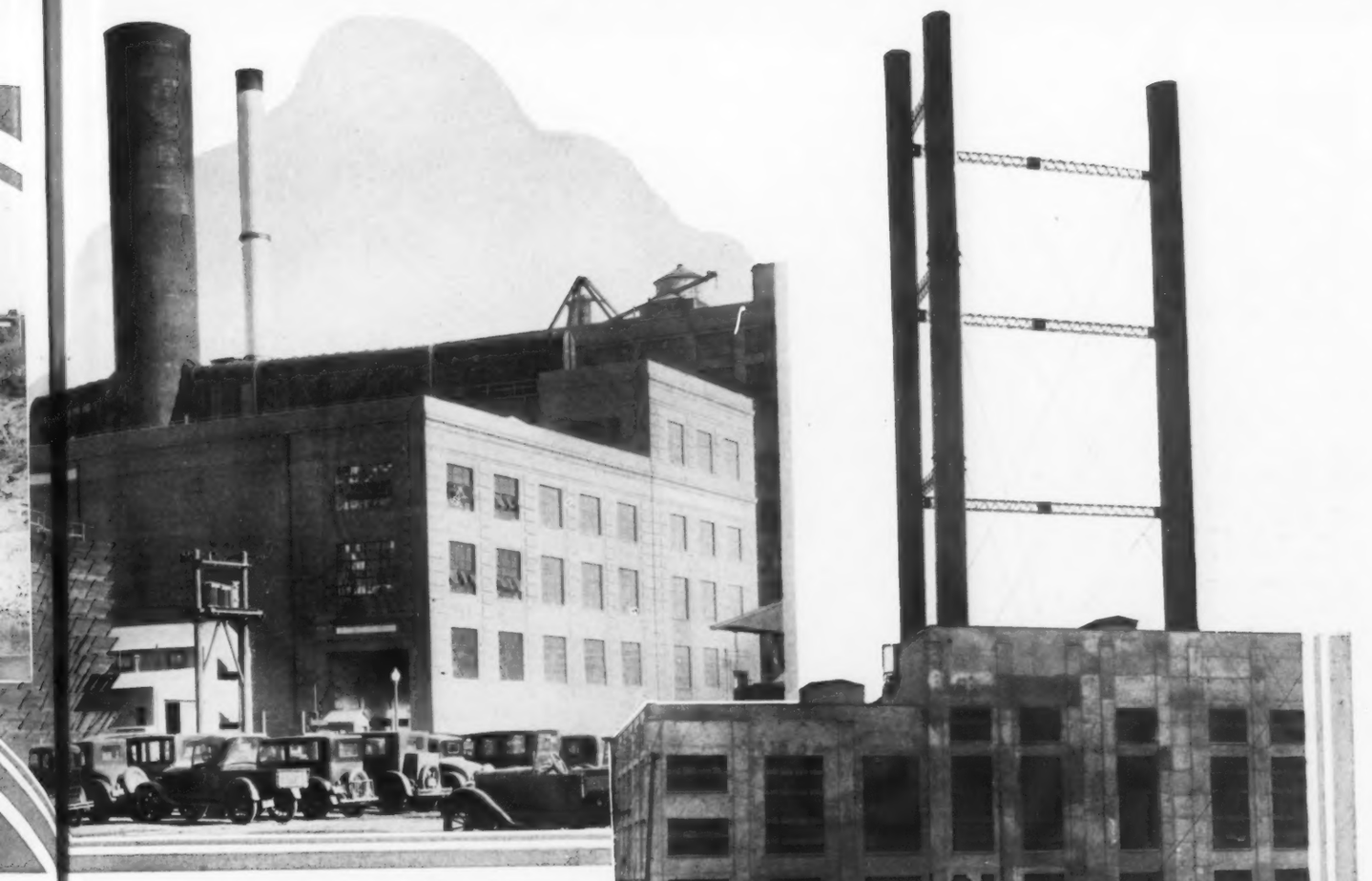


Stewart Mountain dam and 13,000-kva. power house of the Salt River Valley Water Users' Association

Right: The City of Seattle's Diablo dam on the Skagit River completes first step in 120,000-kw. development

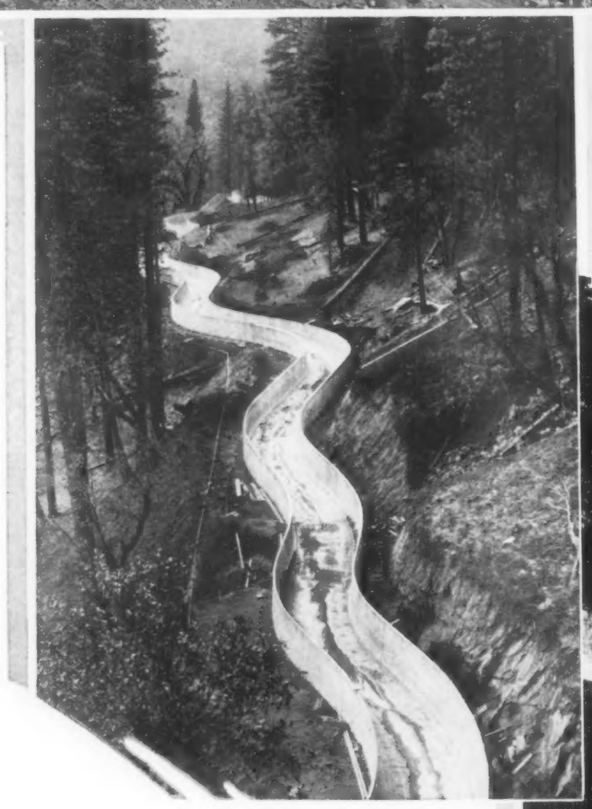


View of power house construction showing rapid progress being made on 180,000-kw. Columbia River development of the Washington Electric Company at Rock Island



Station "A" of the Pacific Gas and Electric Company, generating 50,000 kw., is the first high-pressure steam plant in the West

This 10,000-kw. Marshfield (Ore.) steam plant, burning hogged fuel, is the latest addition to the Mountain States Power Company system



Views of outstanding features of the Mokelumne project of the Pacific Gas and Electric Company

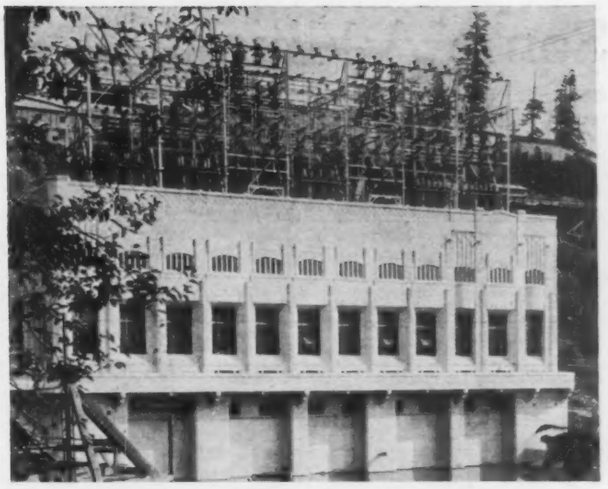
Top: Salt Springs dam and power house which will develop 11,000 kva.

Lower left: Concrete flume to carry impounded water to Tiger Creek watershed

Right: Construction view of 60,000-kva. Tiger Creek power house

Records Broken By 1930 Power Installations

Final Year Culminates Decade of Remarkable Expansion with Addition of 532,300 Kva. to Western Power Company Systems. Additional 494,000 Kva. Projected for 1931



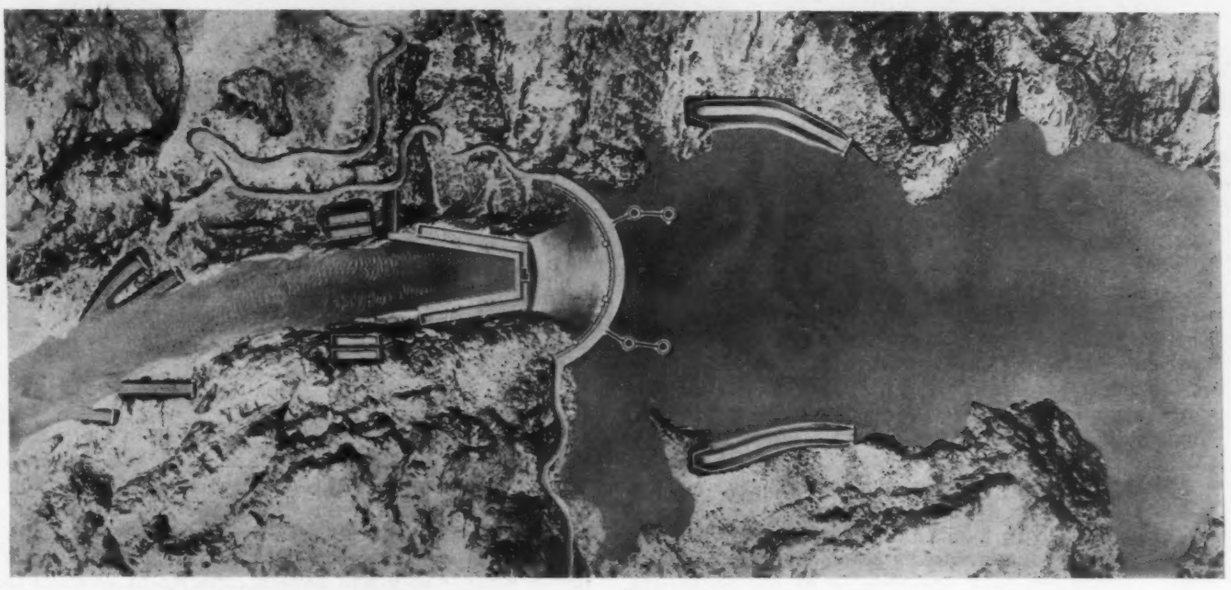
Ruskin power house on Stave River, British Columbia. Note high-voltage switching structure on roof

SURPASSING the achievements of all previous years, the utilities of the eleven Western states have made available an additional 532,300 kva. during 1930. Installations scheduled for completion during the current year and projected generating stations to come on the lines in the early part of 1932 total 494,000 kva. The conceiving and carrying out of this tremendous expansion program at a time when conservatism rather than optimism seems to rule the policy of national industry, is a gratifying expression of the confidence that should unanimously be accorded the inevitable development which this section of the country will enjoy during the next decade.

While falling water continues to supply the major portion of power generated in the West, the capacity of the steam generating stations has exceeded that of the hydro plants added to the lines during the past two years, a condition which has existed only twice during the last decade. In 1930, 255,800 kva. of hydro power and 276,500 kva. of steam power was put into service, but 1931 will see 207,068 kva. in new hydro plants and only 112,500 kva. in new steam plants added to the lines. There is, however, an additional 174,500 kva. of steam generating stations projected and scheduled for completion late during this year or early in 1932.

In the future, hydro-electric development will be even more spectacular than in the past. Natural, easily developed, and close-in power sites of comparatively small ultimate capacity have been utilized in the past years to supplement system growth as required. Up to the present time, the tremendous potential power resources of the larger rivers have offered blocks of power so large compared to the needs of the system as to be unfeasible economically. The rapid growth of power demands has

Airplane photograph of the site of the stupendous Boulder Canyon project, on which is superimposed the architect's conception of the appearance of the completed dam and power house. Installed capacity will be 1,000,000 kva.



Some Additions to Hydro-electric Generating Sta

No.	COMPANY	PLANT	LOCATION	DAMS			CANALS AND TUNNELS			PENSTOCKS			HEAD (Ft.)	
				Type	Reservoir Capacity (Acre-ft.)	Height (Ft.)	Type	Dia. (Ft.)	Length (Ft.)	Dia.	Length (Ft.)	Type	Static	Effective
(1)	Portland Canal Power Company	Davis River	Hyder, Alaska	Concrete	75,000	200	Tunnel	16′	1,600	10′–8′	500	Steel	350	345–295
(2)	Western Power Company of Canada, Ltd. (Sub. B. C. Electric Railway Company, Ltd.)	Ruskin	Stave River	Concrete Gravity	.....	195	Concrete lined penstock	21	219	19	130	Steel lined	127	125
(3)	Washington Electric Company (Sub. Puget Sound Power & Light Company)	Rock Island	Columbia River	Steel Gates	25,000	108	.....	.....	.....	.....	.....	.....	Var.	20–48
(4)	U. S. Bureau of Reclamation	Prosser	Yakima, Wash.	.....	.....	....	Canal	.....	2 mi.	.....	.....	.....	.....	.....
(5)	City of Tacoma, Light Department	Cushman No. 2	Potlatch-Hood Canal, Wash.	Constant Radius	8,000	240	Tunnel	17	13,000	10′ 6″–9′	1,400	Riveted	480–460	450
(6)	Inland Power & Light Company	Ariel	Lewis River, Wash.	Constant Angle	220,000	185	.....	.....	.....	15′ 6″	130	Riveted	260	185
(7)	Centralia Municipal Electric Light & Power Company	Centralia Municipal	Nisqually River	.....	.....	....	.....	.....	.....	.....	.....	.....	.....	205
(8)	Portland General Electric Company	Station "P"	Three Links, Ore.	†	†	†	†	†	†	8′–6′	1,360	Riveted	922	860
(9)	The Montana Power Company	Morony	Missouri River, Mont.	Gravity	2,000	90	.....	.....	.....	21	32	.....	83	82
(10)	U. S. Bureau of Reclamation	Hoover	Colorado River	Arch Gravity	29,500,000	725	2 Tunnels 2 Tunnels	50 30	.....	11	.....	Steel	422–584	.....
(11)	San Joaquin Light & Power Corporation (Sub. Pacific Gas & Electric Company)	Merced Falls	Merced River, Calif.	Gravity	620	34	.....	.....	.....	.....	.....	Concrete	27	27
(12)	Pacific Gas and Electric Company	Tiger Creek	Amador County, Calif.	.....	.....	....	Concrete Flume Tunnel	14′2″x7′ 10′x11′	96,300 12,300	9′–3′	4,751	Riveted & Seamless	1,219	1,190
(13)	Pacific Gas and Electric Company	Salt Springs	Amador County, Calif.	Rock Fill	130,000	328	Tunnel	19′	1,000	10′9″–7′6″	470	Riveted	244	240–50 Var.
(14)	Salt River Valley Water Users' Association	Stewart Mountain	Salt River, Ariz.	Single Arch	70,000	207	.....	.....	.....	13′ 6″	.....	Riveted	114	Var.

†Existing structures or facilities will be used.
*Abbreviations used are: Dom., Dominion Engineering Works; G. E., General Electric Company; Can. West., Canadian Westinghouse Company, Ltd.; A.-C., Allis-Chalmers Manufacturing Company; S. M. S., S. Morgan Smith Company; West., Westinghouse Electric & Manufacturing Company; Pelton, Pelton Water Wheel Company; I. P. M., I. P. Morris Division, William Camp & Sons Ship & Engine Building Corporation.

today made such developments commercially practical, resulting in construction projects of such magnitude as the Boulder Canyon project, Rock Island on the Columbia River, Ariel on the Lewis River, Diablo on the Skagit, and Bridge River in British Columbia.

Notable among the 255,000 kva. of hydro plants completed during 1930 is the Morony development of The Montana Power Company, the seventh of a series of developments on the Missouri River which brings 50,000 additional kva. on that company's lines. Of equal interest from an engineering standpoint, and of almost equal capacity, the 44,000-kva. Ruskin plant of the Western Power Company of Canada, Ltd., completes the final link in the Alouette-Stave River development. The ultimate capacity of this plant will be 188,000 hp. The Salt River Valley Water Users' Association completed another combined irrigation and power development at Stewart Mountain which permits the development of 13,000 kva. at this point. A new 10,000-kva. plant for the City of Centralia, Wash., on the Nisqually River, and the 7,500-kva. Leaburg plant of the City of Eugene complete the total of municipal hydro development during the year. The Portland General Electric Company, with a 30,000-kva. unit for Oak Grove, increased the capacity of an existing development. The San Joaquin Light & Power Corporation introduced outdoor construction for the first time in California with a 4,000-kva. outdoor generator installed at Merced Falls, Calif.

Spectacular as this progress may seem, the achievements promised for 1931 will surpass those of the preceding year in both number and magnitude. The first week in January inaugurated a year of inordinate hydro-electric expansion with the opening of the 55,000-kva. station of the City of Tacoma, known as Cushman No. 2, which will have an ultimate capacity of approximately 130,000 kva. Work on the 150,000-kva. initial installation of the City of Seattle is progressing rapidly and

Dam and power house of the Morony development on the Missouri River in Montana

power will be available from this site late in the current year or early in 1932. Sixty thousand kva. from the Tiger Creek plant and 11,000 kva. from the Salt Springs plant will be available for the Pacific Gas and Electric Company's system in July. The Inland Power & Light Company is well along on the construction of its Ariel power plant, which will have a capacity of 45,000 kva.

Stations in the Eleven Western States, 1930-1931

PRIME MOVERS			GENERATING UNITS			PLANT CAPACITY (kw.)		TRANSFORMERS	TRANSMISSION LINES			PRESENT STAGE OF DEVELOPMENT	ESTIMATED COST	No.
No.	Capacity (hp.)	Maker	No.	Capacity (kva.)	Maker	Present or Proposed	Ultimate		Length (Miles)	Voltage (kv.)	Type			
2	12,500	.....	2	11,000	.....	17,000 (hp.)	50,000 (hp.)	2–11,000-kva. 6,600/66,000 volt	35 43	66 66	Steel Tower Wood Pole	Construction begins March, 1931	$3,000,000	(1)
1	47,000	Dom.*	1	44,000	Can. West.*	47,000 (hp.)	188,000 (hp.)	4–14,670-kva. Can. G. E.	29	66	Wood Pole	Completed 1930	7,250,000	(2)
4	21,000	A.-C.	4	16,667	G. E.	60,000	180,000	7–10,000–15,000-kva. West. 13,800/63,500/110,000 volt	..	...	.....	First two units in Nov. 1931	12,900,000	(3)
..	.....	.....	..	.....	.....	2,400	.....	.....	..	...	.....	Projected	444,000	(4)
2	37,500	A.-C.	2	30,000	A.-C.	75,000 (hp.)	163,500 (hp.)	4–20,000-kva. A.-C.	..	...	.....	Completed March, 1931	5,500,000	(5)
1	61,600	S. M. S.	1	45,000 (kw)	G. E.	45,000	160,000	3–18,750-kva. 110,000 volt	28	110	Wood Pole	Under Construction	8,500,000	(6)
1 1	2,900 2,900	Pelton	2	2,500	West.	2,500	.....	.....	28	66	Wood Pole	Completed, 1930	1,000,000	(7)
1	40,000	Pelton	1	30,000	G. E.	51,000	76,500	2–10,000-kva. West.	..	...	.....	Completed, 1930	800,000	(8)
2	31,000	I. P. M.	2	25,000	West.	45,000	45,000	4–16,667-kva. G. E. 1 phase 13,200/115,000 volt	7.4	110	Wood Pole	Completed January, 1930	4,000,000	(9)
..	.....	.....	..	.....	.....	.....	1,200,000 to 1,600,000 (hp.)	.....	..	...	.....	Contract to be let in 1931	125,000,000	(10)
1	4,750	S. M. S.	1	4,000	West.	4,000 (kva.)	4,000 (kva.)	1–2,500-kva.A.-C.	25	70	Wood Pole	Completed July, 1930	430,000	(11)
2	36,000	Pelton	2	30,000	West.	60,000 (kva.)	60,000 (kva.)	7–G. E. 11,000/110,000/220,000 volt	108.5	220	Steel Tower	To be completed July, 1931	12,890,000	(12)
1	13,500	Pelton	1	11,000	West.	11,000 (kva.)	36,000 (kva.)	4–12,000-kva. A.-C. 11,000/110,000 volt	18	110	Steel Tower	To be completed July, 1931	9,280,000	(13)
1	17,500	S. M. S.	1	13,000	G. E.	13,000 (kva.)	13,000 (kva.)	3–5,000-kva. G. E. 11,000/45,000 volt	13	45	.....	Completed March, 1930	2,300,000	(14)

initially, with an ultimate capacity of 160,000. The much discussed possibility of harnessing the Columbia River will become a reality in November when the Washington Electric Company completes the first two units of an initial installation of 60,000 kva., which will be expanded over a period of years to a total capacity of 225,000 kva.

New projects, construction of which is already started, include the stupendous hydraulic development of Boulder Canyon in Arizona where the Hoover Dam will impound 30,500,000 acre-ft. of water for irrigation, water supply, and power development purposes. The capacity of this gigantic plant will be twelve 75,000-kva. generators, the power from which will be sold for retiring the indebtedness incurred in the construction of the project. The Montana Power Company also is starting on the 140,000-kva. development on the Flathead power site.

A significant event in the history of the electrical industry is scheduled for 1931 when the Portland Canal Power Company begins construction on the first major power project in Alaska. This plant, located on the Davis River, will provide 15,000 kva. of an ultimate development of 50,000 kva. This power will be used for the exploitation and development of the mineral and forest resources of that rich territory.

Careful preparation for adequately supplying the immense power demand anticipated for the near future is reflected, not only in the ultimate capacity of these huge developments, but also in the size of the initial installations. Successfully generating, transmitting, and distributing these tremendous quantities of energy is a tribute to the electrical industry in all its parts and prophetic of the advancement which may confidently be expected for the future.

Table I —Additions to Generating Capacity in the Eleven Western States by Districts 1924-1931

YEAR	CALIFORNIA			PACIFIC NORTHWEST*			INTERMOUNTAIN†		
	Hydro-electric (kva.)	Steam (kva.)	Total (kva.)	Hydro-electric (kva.)	Steam (kva.)	Total (kva.)	Hydro-electric (kva.)	Steam (kva.)	Total (kva.)
1924	68,483	97,000	165,483	135,850	23,000	158,850	38,900	27,500	66,400
1925	243,700	65,000	308,700	62,125	10,000	72,125	15,300	20,000	35,300
1926	33,250	60,555	93,805	60,000	25,000	85,000	18,250	31,250	49,500
1927	67,000	23,750	90,750	77,833	.....	77,833	92,600	3,000	95,600
1928	208,750	227,035	435,785	83,500	6,000	89,500	.....	5,000	5,000
1929	49,500	35,000	84,500	41,750	68,750	110,500	14,000	.....	14,000
1930	4,000	150,000	154,000	146,000	88,750	234,750	68,750	15,000	83,750
1931††	71,000	100,000	171,000	136,068	20,000	156,068	.....	5,000	5,000

*Includes Oregon, Washington, western British Columbia and Alaska.
†Includes Idaho, Montana, Wyoming, Colorado, Utah, New Mexico and eastern Arizona.
††174,500 additional steam capacity projected for California.

Some Additions to Steam Electric Generating

	COMPANY	PLANT	LOCATION	BOILERS				FUEL	PRIME MOVERS		
				No.	Type	Capacity (Boiler hp.)	Maker		No.	Capacity (Kw.)	Maker
(1)	British Columbia Electric Railway Company, Ltd.	Main St.	Vancouver, B. C.	1	Stirling	1,117	P. S. M.*	Oil	1	5,000	G. E.*
(2)	Puget Sound Power & Light Company	Shuffleton 2nd Unit	Lake Washington, Wash.	1	Stirling	2,475	P. S. M.	Oil and Hogged Fuel	1	35,000	G. E.
(3)	City of Tacoma, Light Department	Tide Flats	Tacoma, Wash.	2	Stirling	1,220	P. S. M.	Powdered Coal	1	25,000	G. E.
(4)	Portland General Electric Company	Station "L"	Portland, Ore.	1	Stirling	2,650	B. & W.	Oil and Hogged Fuel	1	35,000	G. E.
(5)	City of Eugene, Utility Department	Eugene	Eugene, Ore.	1	.....	1,400	Erie	Oil	1	6,000	G. E.
(6)	Mountain States Power Company	Marshfield	Marshfield, Ore.	2	Stirling	1,000	B. & W.	Hogged Fuel and Oil	1	10,000	West.
**(7)	Cheyenne Light, Fuel, & Power Company	Cheyenne	Cheyenne, Wyo.	1	Stirling	800	Heine	.....	..	.....	.....
**(8)	Public Service Company of Colorado	Valmont	Boulder, Colo.	1	Stirling	2,140	B. & W.	Pulv. Lignite	..	.....	.....
(9)	San Joaquin Light & Power Corporation (Sub. Pacific Gas & Electric Company)	San Joaquin	Herndon, Calif.	1	.....	.....	.....	Gas	1	50,000	.....
(10)	California Public Service Company	Alturas Diesel	Alturas, Calif.	..	.....	.....	.....	Oil	1	560 (hp.)	F.-M. Diesel
(11)	Pacific Gas and Electric Company	Station "A"	San Francisco, Calif.	3	Cross Drum	.....	B. & W.	Oil and Gas	2	50,000	G. E.
**(12)	Pasadena Municipal Light & Power Department	Glenarm St.	Pasadena, Calif.	2	.....	1,500	.....	Oil and Gas	..	.....	.....
(13)	Southern California Edison Company, Ltd.	Long Beach No. 3, Unit No. 2	Long Beach, Calif.	3	Cross Drum	.....	B. & W.	Oil and Gas	1	94,000	G. E.
(14)	Southern California Edison Company, Ltd.	Long Beach No. 3, Unit No. 3	Long Beach, Calif.	3	Cross Drum	.....	B. & W.	Oil and Gas	1	90,000	.....
(15)	Central Arizona Light & Power Company	Phoenix	Phoenix, Ariz.	2	Stirling	1,217	B. & W.	Oil	1	15,000	G. E.
(16)	Tucson Gas, Electric Light & Power Company	Tucson	Tucson, Ariz.	..	.....	.....	.....	.....	1	3,750 (hp.)	BS Diesel
(17)	Tucson Gas, Electric Light & Power Company	Tucson	Tucson, Ariz.	..	.....	.....	.....	.....	1	4,000 (hp.)	BS Diesel

†Existing structures or facilities will be used.
*Abbreviations used are:—B. & W., Babcock & Wilcox Company; G. E., General Electric Company; West., Westinghouse Electric & Manufacturing Company; P. S. M., Puget Sound Machinery Depot; F.-M., Fairbanks-Morse & Company; BS, Busch Sulzer Bros. Diesel Engine Company; A.-C., Allis-Chalmers Manufacturing Company; Erie, Erie City Iron Works; Heine, Heine Safety Boiler Company.
**Addition to boiler capacity only.

Program of 1931 Continues Trend To Steam Plants

Increased Capacities Definitely Establish Fuel-burning Plants as Vital Factors in Electrical Development of Western States

LONG considered the stronghold of hydro-electric development by virtue of its immense natural water power resources, the West has definitely chosen steam as the most economical method of providing peak and standby service. The gathering momentum of this trend toward fuel burning plants has been apparent during recent years, but it remained for the construction program of 1931 to offer indisputable proof of the importance of this method of power generation.

It is considered especially noteworthy that California will have installed more steam generating capacity than hydro generating capacity in the years 1924 to 1931, inclusive. The total steam capacity installed in that state during this period will be 758,340 kva., whereas the hydro-electric plants' total is 745,623 kva. This ratio is by no means duplicated in the Pacific Northwest and Intermountain sections of the West, but there, also, steam installations make up appreciably larger portions of the total capacity installed, particularly in the former district where the steam generating capacity installed during 1930 and to be completed during 1931 almost equals the total of the steam installations for the preceding six years. The increasing use of this method of power generation can be appreciated by reference to the ratio of hydro-electric power generated to the total power generated in the eleven Western states, the figure dropping from 88.5 per cent in 1927 to 77.8 per cent in 1930.

Stations in the Eleven Western States, 1930-1931

GENERATORS			PLANT CAPACITY (Kw.)		TRANSFORMERS	TRANSMISSION LINES			PRESENT STATUS	ESTIMATED COST	
No.	Capacity (Kva.)	Maker	Present or Proposed	Ultimate		Length (Mi.)	Voltage (Kv.)	Type			
1	5,000 (kw.)	G. E.	17,500	17,500	Feeds into dist. system at gen. voltage	....	....	....	Completed 1930	$182,500	(1)
1	43,750	G. E.	70,000	300,000	3-16,667-kva. West. 11,200/55,000 volt	†	†	†	Completed 1930	.....	(2)
1	25,000 (kw.)	G. E.	25,000	100,000	Feeds into dist. system at gen. voltage	....	....	....	Completed December, 1930	2,000,000	(3)
1	35,000 (kw)	G. E.	77,500	105,000	1-10,000-kva. West.	....	....	....	Completed 1930	1,821,000	(4)
1	6,000 (kw)	G. E.	6,000	24,000	Feeds into dist. system at gen. voltage	....	....	....	To be completed March, 1931	420,000	(5)
1	10,000 (kw.)	West.	15,000	15,000	1-15,000-kva. 4-833-kva. 1 phase 12,000/2,300 volt	....	....	....	Completed 1930	1,250,000	(6)
..	.....	.....	4,000	10,000	.....	....	....	....	Completed January, 1931	165,000	(7)
..	.....	.....	45,000	250,000	.....	....	....	....	Completed 1930	700,000	(8)
1	50,000 (kw.)	.....	50,000	200,000	.....	....	....	....	Projected	5,100,000	(9)
1	480	F.-M.	800	.....	.....	....	....	....	Completed 1930	85,000	(10)
4	2-12,000 kw. 2-38,000 kw.	G. E.	157,000	200,000	Feeds into dist. system at gen. voltage	....	....	....	First unit to be completed February, 1931	6,620,000	(11)
..	.....	.....	34,500	.....	.....	....	....	....	Projected	298,500	(12)
1 1	90,000 4,000	G. E.	200,000	800,000	4-33,333-kva. West. 16,500/220,000 volt	....	.....	....	Completed March, 1930	7,150,000	(13)
1	90,000	.....	300,000	800,000	3-35,000-kw.	....	....	....	Projected	7,000,000	(14)
1	18,750	G. E.	15,000	50,000	2-2,000-kva. G. E.	4½	12	....	Completed 1930	2,400,000	(15)
1	3,750	A. C.	10,000 (hp.)	.....	.....	....	....	....	Completed 1930	.....	(16)
..	.....	.....	.....	.....	.....	....	....	....	To be installed in 1931	.....	(17)

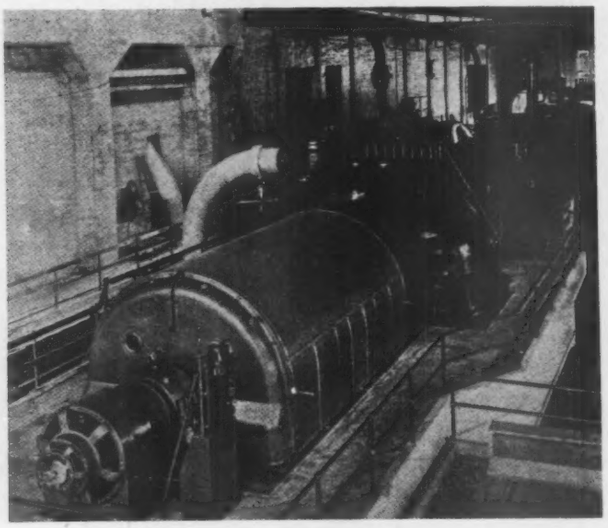
Briefly reviewing the statistics of the eight-year period 1924 to 1931, a total of 2,879,489 kva. has been installed in the eleven Western states. Approximately 39 per cent of this amount was in steam generating capacity, by far the major portion of which has been completed since 1927. California leads this trend toward steam, slightly over 50 per cent of the 1,513,963 kva. installed in that state since 1924 being in steam generating plants. The Intermountain states installed 32 per cent of their 364,550 kva. additions in steam, and the Pacific Northwest devoted 24 per cent of its total of 972,120 kva. of installations to steam facilities, approximately half of which were completed in 1929 and 1930.

The most outstanding example of modern steam generating stations completed in 1930 is the Shuffleton plant of the Puget Sound Power & Light Company, one 43,750-kva. unit of which was put into service in November, 1929, and a second unit, essentially a duplicate of the first, placed in service early in 1930. This plant is unique in that provision is made for utilization of every variety of fuel that the Northwest can offer, namely: Oil, the present fuel; hogged fuel; powdered coal; or natural gas. The Southern California Edison Company continued to expand its Long Beach No. 3 station capacity with the addition of unit No. 2, a 94,000-kva. turbine generator unit. To alleviate the ever present specter of water shortage, the City of Tacoma completed a 31,200-kva. steam plant located near the industrial center of the city. This is the beginning of what is to be a 100,000-kva. station. The Portland General Electric Company added a 35,000-kw. unit to the 42,500-kw. already installed in its station "L"; 18,750 kva. in steam capacity also was added to the Central Arizona Light & Power Company's system at Phoenix to provide power for that system and offer standby service to the Salt River Valley Water Users' Association system. In Oregon, the Mountain States Power Company completed a 12,500-kva. plant at Marshfield. Smaller installations included a 5,250-kva. plant at Vancouver, B. C., for the British Columbia Electric Railway Company, Ltd., as well as a 3,750-kva. Diesel installation for the Tucson Gas, Electric Light & Power Company.

Table I—Additions to Generating Capacity in the 11 Western States, 1924-1931

Year	Hydro-electric Capacity (kva.)	Steam Capacity (kva.)	Total (kva.)
1924	243,223	147,500	390,725
1925	321,125	95,000	416,125
1926	111,500	116,805	228,305
1927	236,433	23,750	260,183
1928	292,250	238,035	530,285
1929	98,250	103,750	202,000
1930	255,800	276,500	532,300
1931	207,068	112,500	319,568
Total for eight year period	1,765,649	1,113,840	2,879,489
Average for eight year period	220,706	139,230	359,936

For 1931 the Pacific Gas and Electric Company will complete the first unit of a 125,000-kva. installation at Station "A." This plant will utilize steam at a pressure of 1,200 lb. and will be the first installation in the West



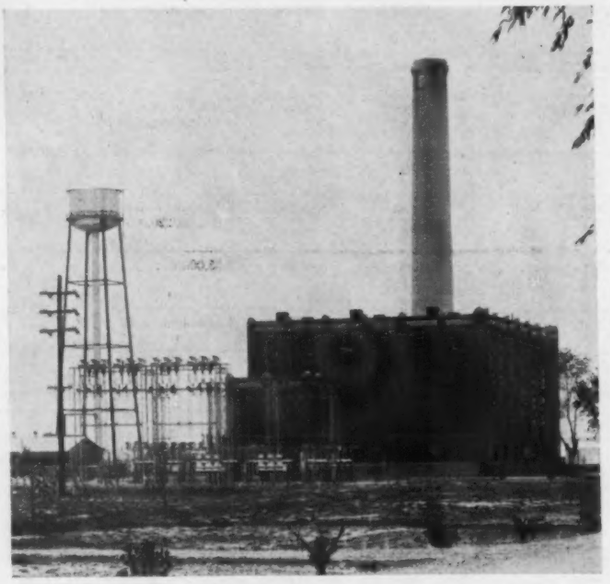
Latest addition to Station "L" of Portland General Electric Company, rated at 35,000 kw.

to take advantage of the economies resulting therefrom. The San Joaquin Light & Power Corporation has announced the construction of a 62,500-kva. steam plant at Herndon, Calif., to be completed in 1932, utilizing natural gas for fuel. Additional boiler capacity for a 25,000-kva. unit is projected for the current year by the City of Pasadena, Calif. Unit No. 3 is already projected for the Long Beach station No. 3, this additional 90,000-kva. being scheduled for service in 1932.

Paralleling the growth in steam installations, though necessarily on a much smaller scale, Diesel engines have become a popular source of power where nominal increases in capacity have been required and where the comparative simplicity of installation and auxiliary equipment is desired. Particularly in the arid sections of the West has this type of prime mover been used extensively. In the first place, the necessity for large amounts of soft water essential for the boiler feed in steam installations, as well as the even larger requirements of cooling water, is eliminated by the use of Diesels. In the second place, load densities in these regions are generally such that blocks of power larger than 5,000 kva. are seldom required, a factor which is ideal from the present standpoints in design of internal combustion engines for stationary service. Also the economical use of fuel and floor space, as well as the reductions possible in station labor costs, has been a feature which has led to the adoption of this type of prime mover.

At the present time, the Tucson Gas, Electric Light & Power Company, at Tucson, Ariz., has approximately 15,000 kva. installed in its power house, this being divided among nine units, the tenth of which is now under consideration. This is the largest concentrated capacity of this type in the West to date. However, there is projected a 40,000-hp. installation by the City of Vernon, the highly industrialized manufacturing district contiguous to the city limits of Los Angeles. The completion of this plant would surpass all previous records for Diesel engine power generation, and, although no definite specifications are as yet available, any development there should prove of the greatest interest to the industry.

A number of unrelated natural conditions experienced in the West during recent years have contributed factors which have impelled the adoption of steam generation for peak load and standby service. The two extremely dry seasons, particularly in the Northwest, may be accepted as the primary economic consideration resulting in the wide use of fuel-burning plants. Increasing distances to available hydro power sites, as well as the cost and vulnerability of long transmission lines, have enabled the steam plant to deliver a kilowatt to the consumer at the least cost. Furthermore, the continued advancement in economy of steam plant operation through the use of high pressures and modern combustion equipment has resulted in materially reduced operating expenses. To complete the favorable conditions for the economic application of steam generation, Nature, as with water power, has lavishly provided the West with an abundance and variety of fuels. Colorado, Utah, and Washington can



New Phoenix steam station of Central Arizona Light & Power Company

provide any required grade of coal. California and the Intermountain states have immense deposits of oil and natural gas, the latter fuel being ideal from the combustion standpoint and low in cost on account of recent legislation compelling its conservation when produced as a byproduct of oil-well exploitation. In the great timber manufacturing centers of the Northwest, hogged fuel is available at low cost. Many of the large load centers being on the coast or on navigable waterways, the problem of economical transportation of the bulky fuels is solved, while pipe lines for oil and natural gas are annually increasing both in capacity and length, providing inland cities with fuel at comparable costs.

These extremely favorable circumstances form the background for the phenomenal growth of steam generating capacity and, as their relative importance tends to increase with the continued development of hydroelectric resources, it may be confidently predicted that fuel will continue to supply an ever increasing proportion of the peak and emergency service of the Western utility systems.

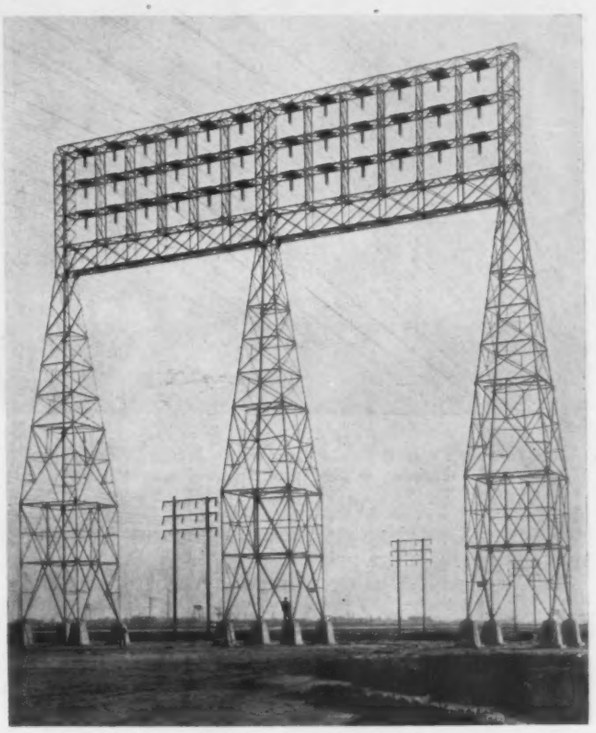
Trend Is Toward Transmission at Higher Voltages

Voltages from 110 to 220 Kv. Specified for Large Portion of Transmission Lines Projected for Current Year. Demand for Increased Capacity Necessitates Use of Two-Circuit Steel Towers as Supporting Structures for Major Additions

TRANSMISSION construction for 1930 and 1931, to a large extent, will effect the tie between the distributing centers and the numerous large power developments recently completed or now under construction. Of the 1,008 miles of high-voltage lines put into service during 1930, 42 per cent were above 70 kv., while lines of this capacity make up almost 70 per cent of the 564 miles projected for 1931. It is significant that most of these high-voltage lines are to carry circuits of 110 kv. or more. The large amount of major transmission construction, necessitated by large developments, supplements the inordinate construction activity in 66-kv. lines and below which has characterized the development in this phase of the industry during the past two years. This activity was the result of efforts to improve system performance through the use of more inter-system tie lines and to provide new possibilities of load growth by expansion into rural districts. Most of the new construction in lines of these potentials will be devoted to this same end, particularly for additions to rural facilities.

Inter-system tie lines, while few in number, were most important from the interconnection viewpoint. The 62 miles of 110-kv. lines from San Bernardino to Seal Beach make interchange of power possible between the large steam capacity of the Los Angeles Gas and Electric Corporation and the hydro system of The Southern Sierras Power Company, the latter company also having completed a 70-mile, 88-kv. line to Blythe, transversing a new territory in that section. The Pacific Power & Light Company constructed 75 miles of 110-kv. lines to connect its White Salmon power station with its system centering at Yakima, Wash. The Puget Sound Power & Light Company is constructing 90.3 miles of 110-kv. line across the Cascade Mountains to bring the power from the Rock Island development to Skykomish, near Seattle. This city will be the terminal also of a 165-kv. line constructed this year by its municipal light department, from the Diablo project.

In California, the 220-kv. line from its new Tiger Creek power house, extending 110 miles to Newark substation, will soon be completed by the Pacific Gas and Electric Company. Quite in keeping in magnitude with the development which it will serve, a 225-mile, 132-kv. transmission line is under construction by The Southern Sierras Power Company to bring power for the construction of the new Boulder Canyon project. Two new lines, each 27 miles long at 110 kv., were completed by the Public Service Company of Colorado. One line transmits power from the Valmont steam station to Denver, and the other connects Fort Lupton and Greeley, Colo.



Multi-circuit steel tower construction carrying twelve 66-kv. circuits of the Southern California Edison Company, Ltd.

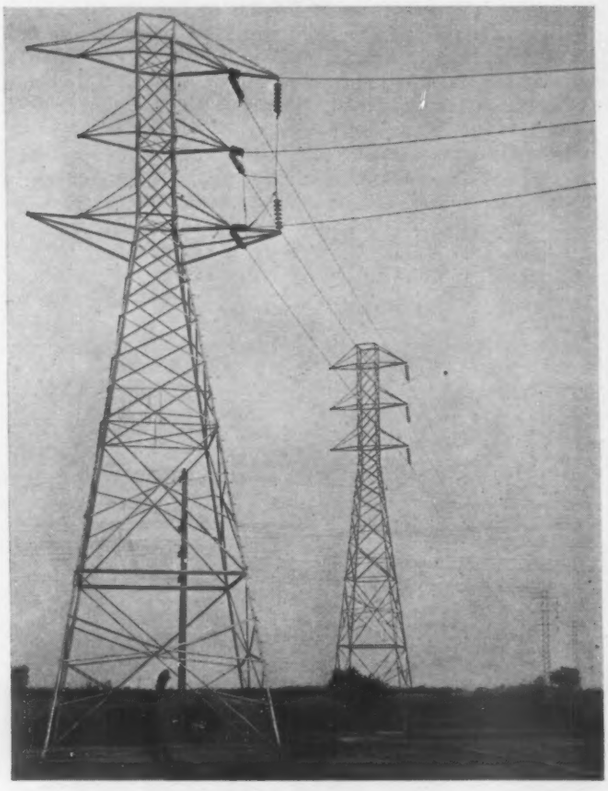
Throughout the West there is continued construction of transmission lines of all voltages to improve reliability by inter-system connections, and in anticipation of future load growth. Particularly in intermountain states have the conveniences of electric service been offered to an increasing number of rural districts. The Washington Water Power Company pioneered among Western utilities in this movement, with the first substations on 110-kv. lines for providing energy to rural customers. The large amount of energy available from new power developments, the unusual length of transmission lines, the comparatively sparsely settled rural districts, and varied topography are all factors peculiar to the West as a whole, but which vary for each system's require-

Transmission Line Mileage Circuit as Reported to Electrical West

Line Potential	Miles Actually completed						Proposed	Proposed	Total Jan. 1
(Kv.)	1925	1926	1927	1928	1929	1930	1930	1931*	1931
30-50	132	326	246	333	340	381	122	20	1,758
51-70	356	151	524	659	310	207	257	177	2,207
71-110	436	385	93	116	65	350	163	132	1,445
111-165	197	....	163	106	33	58	21	225	557
220	17	325	338	117	....	12	414	110	809
Total Addition per year	1,138	1,097	1,364	1,381	748	1,008	997	664	6,736

*Includes line under construction.

ments, resulting in a wide range of transmission practice. While wood-pole lines are still used to a large extent for circuits of 110 kv. and below, the trend toward steel-tower construction becomes more pronounced annually.



San Joaquin Light & Power Corporaton 115-kv. transmission line between Ashlan and Wilson substations

Most companies using voltages from 110 to 220 kv. have found it imperative, because of increasingly large amounts of power transmitted, to use two-circuit steel towers for their main-line circuits. Multi-circuit transmission structures carrying from six to ten 66-kv. circuits have proved an economy for one large company. Lower-voltage lines utilizing various types of wood-pole construction have been subjected to thorough study with the object of obtaining increased reliability together with the construction economies necessary for further electrification of rural districts. However, increased activity in the construction of all classes of transmission lines may be expected as the result of the present expansion of generator capacities throughout the West.

Particularly in the West, utility companies have displayed tremendous initiative in electrifying the urban and suburban home, until, at the present time, electrification of this class of customers approaches the 100 per cent mark for the more densly populated regions. It remains, therefore, for the transmission engineer to supply the facilities for increasing the number of electrified dwellings, a problem fundamentally economic in its aspect. Faced with the necessity of supplying a relatively small load, with the consequent small revenue derived therefrom, with a comparatively large investment in equipment, the logical method of attack has been to endeavor to increase the kilowatt-hours used by each customer and to devise economies in the construction of substations, transmission lines, and service entrances. Transmission lines, generally being a major portion of the cost, have received most consideration with the result that many ingenious schemes have been tried out ranging from steel poles with wooden crossarms to 6 x 6 in. beams bolted to a base consisting of a creosoted stub. The tremendous potentialities for the use of energy in agricultural development have been the subject of widespread discussion and study by both the farmer and engineer, and there is no doubt that the increasing importance of this field for the application of electricity will force the development of economical transmission facilities for this service. While rural transmission will receive its share of attention, increased activity in the construction of all classes of transmission lines may be expected as the result of the present expansion of generator capacities throughout the West.

Some Additions to Transmission Line Construction in the Eleven Western States, 1930-1931

Company	Location	Length (Mi.)	Voltage (Kv.)	No. of Circuits	Supporting Structures	Conductors	Insulators	Spans (Ft.) Av.	Spans (Ft.) Max.	Status	Cost
ALASKA											
Portland Canal Power Company	Davis River to Bear River Valley, Alaska	35 23 20	66 66 66	2 2 1	Steel tower Wood pole Wood pole	3/0 and 0 str. cop. No. 2 sol. cop.	Pin, fog, and suspension	700 (steel) 300 (wood)	1,500	Proposed	‡10,000-7,000 (Steel tower 7,000-6,000 Wood pole)
ARIZONA											
The Arizona Power Company	Octave to Emerson Mine	2.45	44	1	Wood pole *Nedermeyer	No. 4 cop. 3 str. *Anaconda	Thomas Suspension 3 units	400	750	Completed, 1930	$ 4,500
The Arizona Power Company	Prescott to Ash Fork Jn.	50.23	44	1	Wood pole Long Bell	No. 4 cop. solid Anaconda	*Locke pin type	406	740	Completed, 1930	60,000
Central Arizona Light & Power Company	Steam Sta. to Peoria	13	40	1	Wood pole	No. 2 & 4 cop.	Pyrex & West. porcelain pin	275	300	Under construction	.....
Tucson Gas, Electric Light & Power Company	Tucson to Nogales	65	45	1	Wood pole	No. 2 & 0 cop.	*O. B. & Pyrex pin	300	901	Completed, 1930	137,053
Salt River Valley Water Users' Association	Tower 12, Goldfeld-Superior line to Blackwater	24.5	110	1	Wood pole	2/0 cop. Anaconda	Ohio Suspension 7 units	400	....	Under construction	122,500
Salt River Valley Water Users' Association	Sacaton Sub. to Maricopa Sub.	25	45	1	Wood pole	2/0 cop. 7 str. Anaconda	Ohio pin	265	330	Completed, 1930	75,000

†Existing structures or facilities will be used. ‡Estimated cost per mile.

***ABBREVIATIONS:—Poles and Towers:** Benson, Benson Lumber Company; Chapin, Chapin Cedar Company; Johnston, Johnston-Davis Company; E.M.S.Co., E. M. Smith Company; Nedermeyer, Nedermeyer & Martin; P.C.S., Pacific Coast Steel Company; National, National Pole Company; Long Bell, Long Bell Lumber Company; Joslyn, Shaefer-Hitchcock Company; MacFarland, L. D. MacFarland Company, Ltd. **Conductors:** ACSR, Aluminum Company of America; American, American Copper Company; Anaconda, Anaconda Copper Mining Company; Canada, Canada Wire & Cable Company; General, General Cable Corporation; J.A.R., J. A. Roebling's Sons Company. **Insulators:** J. D., Jeffery-Dewitt Insulator Company; Lapp, Lapp Insulator Company, Inc.; Locke, Locke Insulator Corporation; O.B., Ohio Brass Company; Can. O.B., Canadian Ohio Brass Company; Ohio, Ohio Insulator Company; Pyrex, Corning Glass Works; Thomas, The R. Thomas & Sons Company; West., Westinghouse Electric & Manufacturing Company.

Some Additions to Transmission Line Construction in the Eleven Western States, 1930-1931

Company	Location	Length (Mi.)	Voltage (Kv.)	No. of Circuits	Supporting Structures	Conductors	Insulators	Spans (Ft.) Av.	Spans (Ft.) Max.	Status	Cost
BRITISH COLUMB'A											
Western Power Company of Canada, Ltd.	Ruskin to Burnaby Sub.	30	60	2	Wood and steel	477,000 circ. mil. steel reinforced aluminum, Canada	Can. O. B. pin	250	....	Completed, 1930	500,000
Western Power Company of Canada, Ltd.	Stave Falls Power House to Ruskin	3	60	1	Wood pole	477,000 circ. mil. steel reinforced aluminum, Canada	Can. O. B. pin	150	....	Completed, 1930	35,000
CALIFORN A											
San Joaquin Light and Power Corporation.	Ashlan Sub. to Biola Sub.	15.96	70	1	Wood pole	266,800 circ. mil. aluminum	J.D. No. A-267	300	338	Completed, 1930	66,542
San Joaquin Light & Power Corporation.	Ashlan Sub. to Wilson Sub.	47.99	115	1	Steel	46 mi.—795,000 circ. mil. ACSR; 1.99 mi. —500,000 & 250,000 circ. mil. cop.	Dead end, O.B. 26240 Susp. Locke 18002	750	1,214	Completed, 1930	642,960
San Joaquin Light & Power Corporation.	Henrietta Tap to Camden Sub.	5.40	60	1	Wood pole	3/0 aluminum	J.D. No. A-257	330	351	Completed, 1930	18,747.50
Pacific Gas and Electric Company	Salinas to Del Monte	15	60	1	Steel, P.C.S.	2/0 cop., Anaconda	4-part pin, 10" cap & pin susp.	600	850	Under construction	151,000
Pacific Gas and Electric Company.	Columbia Steel Jn. to Shell Chemical Co.	4.5	60	1	Steel, P.C.S.	4/0 cop., Anaconda	4-part pin	600	700	Under construction	71.000
Pacific Gas and Electric Company.	San Mateo City Limits to Redwood City	7.45	60	2	Steel, P.C.S.	4/0 str. cop.	Susp. 6 units West.	880	990	Completed, 1930	200,000
Pacific Gas and Electric Company.	Salt Springs Power House to Tiger Creek Power House	17	110	1	Steel, P.C.S.	4/0 str. cop. General	Susp. 8 units, 9 units, d.e., West.	600	2,126	Under construction	300,000
Pacific Gas and Electric Company.	Morgan Hill Sub. to Gilroy; Lagunitas to Salinas Sub.	17	110	1	Steel, P.C.S.	3/0 str. cop., Anaconda	J.D. susp. 9 units	800	1,974	Completed, 1930	275,000
Pacific Gas and Electric Company.	Tiger Creek Power House to Newark Sub.	110	220	2	Steel, P.C.S.	518,000 circ. mil. ACSR; 500,000 circ. mil. No. 4 h.c. cop. Anaconda	Susp. 11-20 units West., Lapp, & O.B.	800	1,804	Under construction	3,960,000
Coast Counties Gas & Electric Company	Hollister to Watsonville	23	60	1	Wood pole	3/0 cop. str.	Pin	250	....	Proposed	.....
Coast Counties Gas & Electric Company	Morgan Hill to Hollister	26	60	1	Wood pole	3/0 cop. str.	Pin	250	....	Proposed	.....
The Southern Sierras Power Company	Perris to Elsinore	10.34	33	1	Wood pole, Chapin	2/0 cop. str. Anaconda	O.B. pin	264	467	Completed, 1930	38,000
The Southern Sierras Power Company	Branch Line near Inyokern	1.60	33	1	Wood pole, Chapin	No. 6 cop. J.A.R.	J.D. pin	267	271	Completed, 1930	2,600
The Southern Sierras Power Company	Calipatria to Blythe	70.24	88	1	Steel, P.C.S.	4/0 ACSR	J.D. susp. 6 units 7 units d.e.	660	840	Completed, 1930	280,000
The Southern Sierras Power Company & The Nevada-California Company	San Bernardino to Hoover Dam	225	132	1	Fab. steel	4/0 ACSR	Susp. 9 units, 10 units d.e.	750	....	Proposed	1,150,000
The Southern Sierras Power Company	San Bernardino to Seal Beach	61.7	110	1	Steel	2/0 cop. str.	Susp. West. and J.D., 8-9 units; 9-10 in strain	660	1,214	Completed ,1930	590,000
Southern California Edison Company, Ltd.	Montebello to Newmark-Puente line	3.5	66	2	Wood and steel	4/0 cop. str.	Locke No. 5096	....	....	Completed, 1930	55,000
Southern California Edison Company, Ltd.	Laguna Bell Sub. to Whittier Blvd.	2.3	66	4-5-6	Steel	4/0 cop. str.	Locke No. 5800	789	1,096	Completed, 1930	52,612
Southern California Edison Company, Ltd.	Marine Sub. to Jefferson St.	5	66	1	Wood pole	4/0 cop. str.	West. No. 133	....	....	Completed, 1930	26,250
Southern California Edison Company, Ltd.	Laguna Bell Sub. to Ferguson Drive	2.3	220	2	Steel	666,600 circ. mil. aluminum	Std. B 0201	881	1,071	Completed, 1930	45,835
Southern California Edison Company, Ltd.	La Fresa Sub. to Victoria Ave.	0.7	66	8	Steel tower E.M.S. Co.	4/0 cop. str.	Locke No. 5800 5 units	746	900	Completed, 1930	27,124
Southern California Edison Company, Ltd.	La Fresa Sub. to Western Ave.	1.3	66	2	Steel tower E.M.S. Co.	4/0 cop. str.	Locke No. 5800 5 units	785	1,000	Completed, 1930	42,437
Southern California Edison Company, Ltd.	Lighthipe to La Fresa	9.7	220	2	Steel tower	666,600 circ. mil. ACSR; 692,000 circ. mil. cop. bronze	Lapp No. 2094 and and 5085	914	1,335	Completed, 1930	370,430
Southern California Edison Company, Ltd.	La Fresa to El Segundo	6.3	66	7-9-10	Steel Tower E.M.S. Co.	4/0 cop. str.	Locke No. 5800 5 units	....	....	Completed, 1930	288,592
Southern California Edison Company, Ltd.	Saticoy Sub. to Casitas Sub.	11.4	66	1	†	2/0 cop. str. Anaconda	Locke No. 5996 Susp. 5 units	200	....	Completed, 1930	27,615
Southern California Edison Company, Ltd.	Fixley Sub. to Earlimart-Tipton line	2.5	66	1	Wood pole National	No. 2 cop. str. Anaconda	Locke No. 5996 Susp. 4 units	205	....	Completed, 1930	8,950
Southern California Edison Company, Ltd.	Poplar Sub. to Vestal-Woodville line	2	66	1	Wood pole National	No. 2 cop. str. Anaconda	Locke No. 5996 Susp. 4 units	220	....	Completed, 1930	7,400
Southern California Edison Company, Ltd.	Octol Sub. to Tipton, Tulare line	5.3	66	1	Wood pole National	No. 2 cop. str. Anaconda	Locke No. 5996 Susp. 4 units	220	228	Completed, 1930	17,500
Southern California Edison Company, Ltd.	Bliss Sub. to Tulare-Lindsay line	3.5	66	1	Wood pole National	No. 2 cop. str. Anaconda	Locke No. 5996 Susp. 4 units	210	225	Completed, 1930	12,500
Southern California Edison Company, Ltd.	Saugus Sub. to Saticoy Sub.	39	66	1	†	4/0 cop. str. Anaconda	Locke No. 5996 Susp. 5 units.	650	2,759	Completed, 1930	116,000
Southern California Edison Company, Ltd.	Canesha Sub. to Chino-Puente line	3.9	66	2	Steel E.M.S. Co.	2/0 cop. str. Anaconda	Locke No. 5996 Susp. 5 units	360	....	Completed, 1930	54,865
Southern California Edison Company, Ltd.	El Segundo Sub. to Centinella Blvd.	5.1	66	1	†	4/0 cop. str. Anaconda	Locke No. 5996 Susp. 5 units	180	225	Completed, 1930	17,990
Southern California Edison Company, Ltd.	Pedley Sub. to Colton	17	66	1	Wood pole National	4/0 cop. str. Anaconda	Locke No. 5996 Susp. 4 units	175	800	Completed, 1930	103,101

Some Additions to Transmission Line Construction in the Eleven Western States, 1930-1931

Company	Location	Length (Mi.)	Voltage (Kv.)	No. of Circuits	Supporting Structures	Conductors	Insulators	Spans (Ft.) Av.	Spans (Ft.) Max.	Status	Cost
Southeara California Edison Company, Ltd.	Fullerton Sub to Katella Sub.	5.8	66	1-2 mi. 2-3.8 mi.	Wood pole National	2/0 ecp. str. Anaconda	Locke No. 5996 Susp. 5 units	180	215	Completed, 1930	53,400
Southern California Edison Company, Ltd.	Inglewood Ave. to Blossom Lane (Inglewood)	1.6	66	1	Wood pole National	4/0 ecp. str Anaconda	Locke No. 5996 Susp. 5 units	150	165	Completed, 1930	12,400
Southern California Edison Company, Ltd.	Hawthorne Blvd. (Hawthorne)	2.9	66	1	Wood pole National	4/0 ecp. str. Anaconda	Locke No. 5996 Susp. 5 units	175	191	Completed, 1930	21,400
Southern California Edison Company, Ltd.	Somerset Sub to Spring-Somerset Sta.	4.8	66	1	Wood pole National	4/0 ecp. str. Anaconda	Locke No. 5996 Susp. 5 units	175	190	Completed, 1930	31,600
Los Angeles Bureau of Power & Light	Station "C" to Peddler System	3.5	33	1	Wood pole	1/0 ecp. str.	O.B. pin	180	...	Completed, 1930	.....
Los Angeles Bureau of Power & Light	Station 15 to Station 6	3.2	33	1	Wood pole	3/0 ecp. str.	O.B. pin	180	....	Completed, 1930	.....
Los Angeles Bureau of Power & Light	Station 22 to Station 41	2.0	33	1	Wood pole	No. 2 ecp. sol.	O.B. pin	180	....	Completed, 1930	.....
Los Angeles Bureau of Power & Light	Rec. Sta. "B" to Rec. Sta. "C"	10.7	132	2	Steel	500,000 circ. mil ecp.	O.B. 9 susp.	750	....	Completed, 1930	.....
San Diego Consolidated Gas & Electric Company	El Cajon to Escondido	28.5	66	1	Wood pole Benson	No. 1 ecp. str. Anaconda	O.B. No. 26731 Locke No. 5800 5 susp., 6 str.	415	2,378	Completed, 1930	160,000
COLORADO											
Public Service Company of Colorado	Valmont to Denver	27.066	110	1	Wood-24 mi. Steel-3 mi.	266,800 circ. mil. ACSR-24 mi. 4/0 ACSR & 336,400 circ. mil.-3 mi.	O.B. No. 25622 susp., 7 units O.B. No. 26240 d.e., 7 units	624	1,663	Completed, 1930	147,000
Public Service Company of Colorado	Ft. Lupton to Greeley	27	110	1	Wood pole	3/0 ACSR	O.B. No. 25622 7 susp., 8 d.e.	652	920	Completed, 1930	135,000
Western Colorado Power Company	Coal Creek to Silverton	13.5	44	1	Wood pole	No. 1 ecp. 7 str. Anaconda	Locke pin	325	1,050	Completed, 1930	37,500
MONTANA											
Mountain States Power Company	Big Fork to Kalispell	22.5	33	1	Wood pole	No. 2 ecp. Anaconda	Locke pin	267	300	Completed, 1930	.....
Mountain States Power Company	Forsyth to Horton	23	33	1	Wood pole, Joslin	No. 4 ecp., Anaconda	O.B. pin	260	290	Completed, 1930	.....
The Montana Power Company	Mystic Lake to Columbus	42	50	1	Wood pole	91,000 circ. mil. ecp. Anaconda	Pin type	300	....	Completed, 1930	84,000
The Montana Power Company	Morony to Rainbow Sw. Station	7.4	100	1	Wood pole	250,000 circ. mil. ecp. Anaconda	O.B. Susp., 6 units	400	....	Completed, 1930	55,000
The Montana Power Company	Plains to Polson	35.3	50	1	Wood pole	49,500 circ. mil. ecp. str. Anaconda	Pyrex pin	250	....	Completed, 1930	68,000
OREGON											
Portland General Electric Company	Station "M" to Swift Ry. Station	12.2	57	1	Wood pole	4/0 ACSR	O.B. pin	300	484	Under construction	47,384
Portland General Electric Company	Burlington to Beaverton	16.75	57	1	Wood pole	1/0 ecp.-6.25 mi., 3/0 al.-4.75 mi., 2/0 al.-5.75 mi.	O. B. pin	200	350	Under construction	42,386
Mountain States Power Company	Independence to Dallas	7	66	1	Wood pole MacFarland	2/0 ecp. Anaconda	O. B. pin	262	350	Completed, 1930	.....
WASHINGTON											
Puget Sound Power & Light Company	Rock Island to Skykomish	90.3	110	1	Wood and steel	4/0 ecp., 336,400 circ. mil. ACSR-20 mi.	Thomas 1146A 6 susp. 7 str.	511	1,500	Under construction	1,500,000
Pacific Power & Light Company	Yakima to White Salmon	75	110	1	Wood pole	250,000 circ. mil. ecp. Anaconda	Locke, Thomas, susp.	550	1,800	Completed, 1930	600,000
Western Washington Electric Light & Power Company	Aberdeen to Raymond	28	66	1	Steel, P.C.S.	4/0 ecp. 7 str. American	Thomas ball & socket	600	1,600	Completed, 1930	200,000
Peoples' West Coast Hydroelectric Corporation	South Bend to Ilwaco	40	33	1	Wood pole Johnston	No. 4 & 2 ecp. Anaconda	Locke pin, J.D. strain	300	750	Completed, 1930	.....
The Washington Water Power Company	Spokane, Freya St., to freq. chg. station	1.5	60	1	Wood pole	No. 8 ecp. 7 str. Anaconda	J. D. 4 susp., 5 strain	367	530	Completed, 1930	12,104
West Coast Power Company	Grays River to South Bend-Ilwaco Highway	17	33	1	Wood pole	No. 2 B&S ecp. sol.	No. 401 Pyrex pin J. D. strain type	300	....	Completed, 1930	35,000
The Washington Water Power Company	Spokane to Kellogg, Idaho	64.98	110	1	Wood pole	250,000 circ. mil. ecp. Anaconda	Locke cap & pin socket type, 6 susp., 7 strain	500	2,900	Completed, 1930	799,000
The Washington Water Power Company	Garfield to Palouse	7.9	60	1	Wood pole	No. 8 ecp., 7 str.	J. D. 3 susp., 4 strain	500	1,196	Completed, 1930	66,360
The Washington Water Power Company	Moscow to Lewiston, Idaho	23.1	60	1	Wood pole	No. 8 ecp., 7 str.	J. D. 3 susp., 4 strain	350	1,264	Under construction	194,040
WYOMING											
Mountain States Power Company	Colter to Gebo	18	33	1	Wood pole Joslin	No. 4 ecp. Anaconda	O.B. pin	275	325	Completed, 1930	.....
U. S. Bureau of Reclamation	Shoshone Dam to Cody	6	33	1	Steel and wood	1/0 ACSR	O.B. susp. and pin	400	1,100	Completed, 1930	25,000

†Existing structures or facilities will be used. ‡Estimated cost per mile.

***ABBREVIATIONS:—Poles and Towers:** Benson, Benson Lumber Company; Chapin, Chapin Cedar Company; Johnston, Johnston-Davis Company; E.M.S.Co., E. M. Smith Company; Nedermeyer, Nedermeyer & Martin; P.C.S., Pacific Coast Steel Company; National, National Pole Company; Long Bell, Long Bell Lumber Company; Joslyn, Shaefer-Hitchcock Company; MacFarland, L. D. MacFarland Company, Ltd. **Conductors:** ACSR, Aluminum Company of America; American, American Copper Company; Anaconda, Anaconda Copper Mining Company; Canada, Canada Wire & Cable Company; General, General Cable Corporation; J.A.R., J. A. Roebling's Sons Company. **Insulators:** J. D. Jeffery-Dewitt Insulator Company; Lapp, Lapp Insulator Company, Inc.; Locke, Locke Insulator Corporation; O.B., Ohio Brass Company; Can. O.B., Canadian Ohio Brass Company; Ohio, Ohio Insulator Company; Pyrex, Corning Glass Works; Thomas, The R. Thomas & Sons Company; West., Westinghouse Electric & Manufacturing Company

QUOTAS and manufacturing indexes point to a Western appliance market in 1931 of $83,556,000. Of this huge total, some of the major items are:

Electric Ranges	$ 9,827,000
Water and Air Heaters	2,772,000
Electric Refrigerators	25,680,000
Table Appliances	4,103,000
Electric Clocks	2,017,000
Washing Machines	10,134,000
Vacuum Cleaners	7,126,000
Electric Ironers	1,105,000

"not what we have done— but

1930 Sales 1931 Quotas	Range, Water Heater, and Refrigerator Sales					
CENTRAL STATION	Ranges		Water Heaters		Refrig-erators	
	1930	1931	1930	1931	1930	1931
B. C. Elec. Ry. Co.—Vancouver	959	.....	253	.....	400*	.....
B. C. Elec. Ry. Co.—Victoria	200	.....	100	.....	350	.....
California-Oregon Pwr. Co.	.....	.....	.....	.....	.....	.....
Central Ariz. Lt. & Pwr. Co.	307	425	122	300	800	1,000
Coast Counties Gas & Elec. Co.	66	100	78	100	148	175
Idaho Power Co.	3,737*	3,740*	2,258	2,350	977	1,450*
Los Angeles Bur. Pwr. & Lt.	531	.....	101	.....	.....	.....
Los Angeles Gas & Elec. Co.	178*	.....	56*	.....	.....	.....
Northwestern Elec. Co.	1,234	1,400	483	500	250	.....
Pacific Gas & Elec. Co.	5,759*	6,000	2,388*	2,500	16,500†	23,278†
Pacific Power & Lt. Co.	1,523*	1,648	932*	1,236	1,205*	1,236
Portland Gen. Elec. Co.	2,000*	2,000*	450*	350	371	450
Public Service Co. of Colo.	802	1,232	20	46	2,179	2,235
Puget Sound Pwr. & Lt. Co.	6,009*	.....	2,000*	.....	4,000*	.....
Salt River Valley Water Users Ass'n.	283	300	41	50	133	150
San Diego Consol. Gas & Elec. Co.	429*	360	220*	180	423	640
San Joaquin Lt. & Pwr. Co.	1,575*	.....	1,040*	.....	3,000*	.....
Seattle Lighting Department	2,693	3,000	840	1,000	99	150
Sierra Pacific Power Co.	294	400	129	150	296	400
So. Calif. Edison Co.	5,900	7,500	1,105	1,600	3,000*	6,000
So. Colorado Power Co.	364	615	265	182	140	293
So. Sierras Power Co.	479	500	187	250	88	150
Tacoma Dept. Lt. & Pwr.	684	.....	399	.....	.....	.....
Utah Power & Lt. Co.	3,615	4,000	1,203	2,000	2,319	3,000
Valley Electrical Supply Co.	1,543	1,700*	974	969*	2,061*	2,848*
Washington Water Pwr. Co.	692	1,600	1,108	1,130	.....	.....
Western Colo. Pwr. Co.	38	.....	.....	.....	56	.....

*Including estimated dealer sales. †Estimated dealer sales alone.

NOT HOW MUCH we have done, but how large is the opportunity before us? This seems to be the present concept of the business of selling kilowatts, at least as expressed by a number of commercial executives. In response to ELECTRICAL WEST'S questions as to results during 1930, if a composite answer could have been phrased, it might well have read:

"The past is not important. We are proud of it, of course. Our companies weathered the depression exceptionally well. What we lost on industrial power load we made up on domestic uses. Appliance quotas in most cases were met, or nearly so. Lighting continues to increase. Considering the revenue from this retail type of load as compared with the lesser income from the bulk of what may be termed wholesale power load to industrials, our net has held up very well.

"So much for 1930 and the years preceding it. More important is 1931 and beyond. What promise does it hold in return for the hard work which it may require? Is the job big enough to embrace the entire electrical industry or will it be limited to a few well prepared groups? Are we facing a saturated market? Must we be satisfied to rest our oars?

"Never mind yesterday—it will take care of itself. What we want to know is—what of today and tomorrow?"

No such note of realism has been present in previous years' reports. Today, if the exuberant optimism is lacking, in its place there is a reasoning, clear headed facing of facts. Nowhere is there any pessimism. Let that be said. All faces are turned to the future unafraid.

Upon reasonable indications from which predictions can be made, there is every reason to look into the future with assurance. In the domestic field alone, if the figure 5,000 kw.-hr. be taken as a normal, reasonable objective for each domestic consumer, the figures on these pages, reporting on the average attained to date, allow ample room for more complete electrification. Only nine companies out of twenty-seven have achieved 1,000 kw.-hr. average per year, or one-fifth of this figure.

Lest it be said that 5,000 kw.-hr. domestic consumption is high, it must be understood that this figure in individual homes is not uncommon. These are for modest homes too, and by no means represent what might be felt to be "over electrification," if such a thing is conceivable. In other words, these figures represent homes in which an ample use of electricity is made, to, be sure, but only a reasonable and perfectly logical use.

Home electrification can be considered to have attained only one-fifth accomplishment at most. Considering the 20,000 different appliances available for various tasks in and about a home, the average number in use is still ridiculously small.

In industrial fields, though plants are quite generally motorized these days, there is still a tremendous market. Motorization, important though it is, is really but the preliminary step. Industrial heat so far has only teased the imagination as to its possibilities. Electro-chemical

Though 1930 tested the commercial stamina of the industry sorely quotas were not far short of attainment, and revenues increased. But for 1931 and the future, leaders feel there is so much more to be done that it will take the combined efforts of all dealers and central stations to approach filling the needs which the public has, but does not yet realize fully, for greater electrification

how large is our future opportunity?"

Kw.-hr. Per Residential Consumer

COMPANY NAME	1930	1929	1928	1927
B. C. Elec. Ry. Co.—Vancouver	940	870	.....	.....
B. C. Elec. Ry. Co.—Victoria	710	700	670	660
California-Oregon Power Co.	.....	.....	.....	.....
Central Arizona Lt. & Power Co.	665	592	472	454
Coast Counties Gas & Elec. Co.	695	614	.....	.....
Idaho Power Company	1,447	1,252	1,162	.....
Los Angeles Bur. Pwr. & Lt.	521	475	443	398
Northwestern Elec. Co.	1,150	1,058	1,019	938
Pacific Gas & Electric Co.	697	628	.....	.....
Pacific Power & Lt. Co.	1,170	994	811	687
Portland Gen. Elec. Co.	984	935	853	760
Public Service Co. of Colo.	427.5	387	354	333.4
Puget Sound Pwr. & Lt. Co.	1,109	954	851	765
Salt River Valley Water Users Ass'n.	1,509	1,241†	1,913	1,613
San Diego Consol. Gas & Elec. Co.	553	496.3	.....	.....
San Joaquin Light & Pwr. Co.	940	835	758	642
Seattle Lighting Department	1,084	1,031*	941	838
Sierra Pacific Power Co.	733.9	716	644	620.2
So. Calif. Edison Co.	682	640	573	513
So. Colorado Power Co.	495.4	435.6	441.9	387.5
So. Sierras Power Co.	800*	690	596	562
Tacoma Dept. of Lt. & Pwr.	1,494	1,337	1,285	.....
Utah Power & Light Co.	720	.....	.....	.....
Washington Water Power Co.	1,684	.....	.....	.....

All figures based on N.E.L.A. contest rules unless otherwise noted. †Not on N.E.L.A. basis. *Estimated.

processes are in mere primary grade of development. Electron tube control and supervision are still talking and singing toys compared to the man's work they must assume some day soon.

Railroad electrification, which first engaged the electrical executive's attention, has been abandoned in search of riper, more lucrative markets. But who will say that the time is not auspicious for a renewed activity in this field? The West offers particular and peculiar demands for such development.

Lighting? It was said of lighting twenty years ago that it had thoroughly saturated its market. Yet not more than a few miles of highway today are lighted. Residential and many business districts still are gloomy and dark at night. The six- or eight-foot-candle intensity for office or factory lighting which was good a year or two ago, or the twenty- to thirty-foot-candle intensity considered excellent today are still far short of daylight's one-thousand- to ten-thousand-foot-candle intensities out doors. And then there is artificial sunlight, with all its health-giving rays left in, still to be sold to every office and home. Who can predict the future of vapor-tube lighting or of the health appliance field?

So big is this task that by no stretch of the imagination can it be accomplished by the central stations alone. Nor does it seem that the commercial managers are unaware of this fact. In almost every report in the succeeding pages efforts to invoke the assistance of retail dealers are outlined and the promise is practically unanimous that the dealers' interest will be considered more closely than heretofore. Several companies have announced special programs which will invite the assistance of dealers in order to make them effective. Methods of compensation and supervision of salesmen are likewise under scrutiny.

Certainly, if this bigger electrical market, to reach 5,000 kw.-hr. per domestic consumer average, is to be realized, it is a job that calls for dealer and central station sales forces in united front.

The Reports Which Follow

From the reports on succeeding pages there have been taken the 1930 major appliance accomplishment figures and the 1931 quotas. These are combined in a table on page 78. Likewise, the kilowatt-hours per domestic consumer figures are arranged in a table here. The detailed statements of commercial executives present a picture of the territory each company serves and are well worth reading.

Increased Activity Maintains Volume

By EDMUND E. WALKER

Sales Engineer, Vancouver District, B. C. Electric Railway Company, Ltd.

NOTWITHSTANDING the depressed conditions, our merchandising activities were carried on along the same lines as in previous years, and through increased sales activity a very satisfactory sales volume was maintained throughout the year. There were no outstanding campaigns and, due to the power shortage situation, our range activities were adversely affected during the early part of the year.

With regard to the growth in our consumers during 1930, the approximate added load is:

	Kw.
Domestic	12,500
Commercial lighting	3,500
Industrial power	5,250
Total	21,250

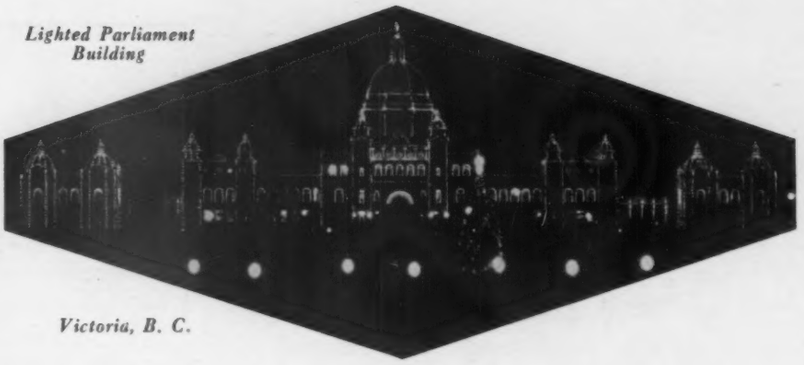
And the average domestic consumption, including flat rate water heaters, is:

1929	870 kw.-hr.
1930 (estimated)	940 kw.-hr.

Regarding 1931, our quotas have not yet been set for the year but there are indications that business is on the upgrade and we are now planning a big range campaign and have started the year very successfully by featuring "Spic Span" vacuum cleaners for the month of January, setting the quota at 700. This quota had already been reached by the middle of the month and the indications are that we shall sell well over a thousand. The features of this campaign are low terms and a slogan, "Take me home for 50 cents." These proved good sales-getters. One of the main points of this campaign is to interest our employees in what we call our "Employees Selling Plan," whereby they are given a commission for sending in the names of prospects for the various load-building appliances. This campaign is proving very successful along this line and in creating greater interest in the merchandising activities of the company.

We make our budget to cover twelve months from June 30 each year, and therefore cannot give any definite quotas for 1931. We shall be guided largely by the business conditions later on in the season.

Lighted Parliament Building



Victoria, B. C.

Merchandise Sales Satisfactory

By S. J. HALLS

Manager, Light & Power Department, British Columbia Electric Railway Company, Ltd., Victoria Division

INCREASES in business in our lighting, power and merchandising departments made 1930 a year of reasonable progress. The figures contained below illustrate these increases which, while not up to the increases of 1929, are well above the average attained during the several years previous.

Our policy of making rural extensions was continued and during the year a considerable number of consumers were added to our lines. Due to some curtailment in the building industry, the number of urban consumers was less than during previous years. A total of 971 lighting consumers (domestic and commercial) were added to our system, making a total of 21,918 consumers connected; the increase in connected lighting load was 2,209 kw., making a total of 23,906 kw. connected.

Average kilowatt-hour consumption per domestic consumer is slightly over the previous year: 710 during 1930, 700 during 1929, and 670 during 1928.

There has been a continuous and steady increase in the amount of energy sold for power purposes. The connected load increased by 252 hp. during the year and now totals 36,700 hp.

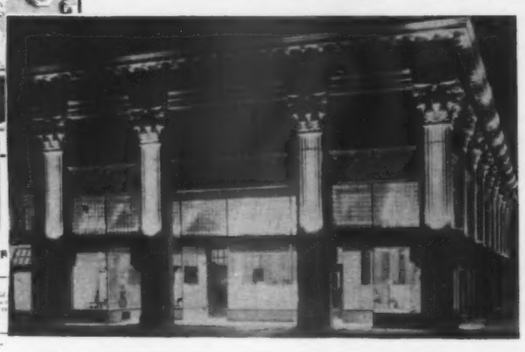
During the year in question the volume of our merchandise sales increased over 1929 by approximately 8.4 per cent, which we consider reasonably satisfactory in view of conditions. Special demonstrations, including an electrical cooking and refrigeration school, were carried out with very satisfactory results. Seasonal campaigns featuring electric washers, cleaners, etc., were operated and continuous and consistent efforts were put forth in all lines with the result that our volume increased as noted above.

We expect during the coming year to continue the policies which we have in the past found successful and are hoping to carry on, in conjunction with local contractor-dealers, special electric cooking and electric refrigeration demonstrations and schools. We believe these efforts will enable us to increase still further our sales during this year, and if our experiences during the past year are any criterion we are justified in anticipating that our efforts in 1931 will be well rewarded.

No merchandiser, this California company aided other branches of the industry by co-operative advertising

Is your kitchen a dark, gloomy, unpleasant place to work in—a strain on eyes, nerves and disposition?
Or has it the bright, cheery abundance of good light that makes your housework easier?
A strong, central ceiling fixture, eliminating shadows and gloomy corners, is the base of good kitchen lighting. Additional shaded lights over stove and sink will provide extra illumination where the need is greatest.
The Kitchen is one of the most used rooms in the home—see that it is one of the best lighted.
Get Expert Advice FREE
Our Illuminating Engineer will advise you, without cost, on good home lighting. Call the Commercial Engineering Department—Fiske 6161. (We do not sell lighting equipment.)
Convenience Outlets and Service Inlets
Los Angeles Gas and Electric Corporation

Central Arizona Light & Power Company's office



Year Considered Successful

By A. F. MORAIRTY

Assistant General Manager, Central Arizona Light & Power Company

IN REVIEWING the commercial development of the Central Arizona Light & Power Company for the year just past, one must necessarily take into consideration the fact that it was a year of general national depression which, of course, affected to some extent all commercial activities or enterprises. Considering the fact that all commercial activities met with greater sales resistance during the past year, requiring increased effort on the part of all departments engaged in the promotion of new business and merchandise sales, we consider the year to have been a successful one.

The average annual kilowatt-hour consumption of electricity per domestic

customer for 1930 was 665 kw.-hr., 1929, 592 kw.-hr., 1928, 472 kw.-hr., and 1927, 454 kw.-hr.

Electric merchandise sales for the year showed an increase of 7 per cent over 1929, and an increase of 20 per cent over total sales for 1927. At a meeting of the heads of the merchandise department early in January, 1930, it was decided to concentrate all promotional activities on three major electrical appliances throughout the year, namely the electric refrigerator, range, and water heater, rather than on the minor appliances. During the month of February an electric refrigerator campaign was conducted which resulted in the sale of 242 units, as against 43 refrigerator sales in February, 1929. Intensive monthly refrigerator campaigns were conducted throughout the year, ending with a Christmas campaign which resulted in 40 refrigerator sales. Total electrical refrigerator sales for 1930 were 800, an increase of 25 per cent over 1929 sales, or 37.6 refrigerators sold per 1,000 customers during the year. Three hundred and seven electric ranges and 122 electric water heaters were added to the system during 1930. The electric cooking and water heating district is in a limited area in which the sale of ranges and water heaters has been intensively promoted during the past five years, and this district is gradually reaching the saturation point.

Lamp bulb sales for the year amount to 35,804, an increase of 40 per cent over lamp sales in 1929.

Sales quotas for 1931 have been proportionately increased over 1930 so as to result in a 15 per cent increase in total sales over 1930 if quotas are reached. Our merchandise department plans to sell 1,000 electric refrigerators, 300 electric water heaters, and 425 electric ranges in addition to miscellaneous other appliances. Sales promotion activities will be concentrated on these three major appliances in much the same way as was done in 1930.

An Arizona Edison Company salesroom at night

Average annual domestic consumption in San Diego has risen until this thermometer needs lengthening

1931 Will Show Increase in Sales

By PIERRE VINET

New Business Manager, Coast Counties Gas & Electric Company

WE FEEL that the best way we can outline our performances during the past year is to give figures for our entire system for the twelve months ended November, 1930. This will be a good indication of what has been accomplished during the entire year of 1930, although, as the month of December is not included, figures will be a little above average.

With reference to electrical merchandising, we cannot consider 1930 a good year because of the advent of natural gas. The efforts of all our salesmen were placed on gas appliance campaigns, leaving electric appliance sales to take care of themselves. For 1931, beginning Jan. 12, we are planning to resume our regular electric campaigns and these efforts will naturally show a nice increase in merchandise sales for 1931 over 1930.

It will be noted that there has been a decrease in residence lighting all the way through, but a substantial increase is shown in the combination service, minor and major, due to the changing of several customers to the latter classifications.

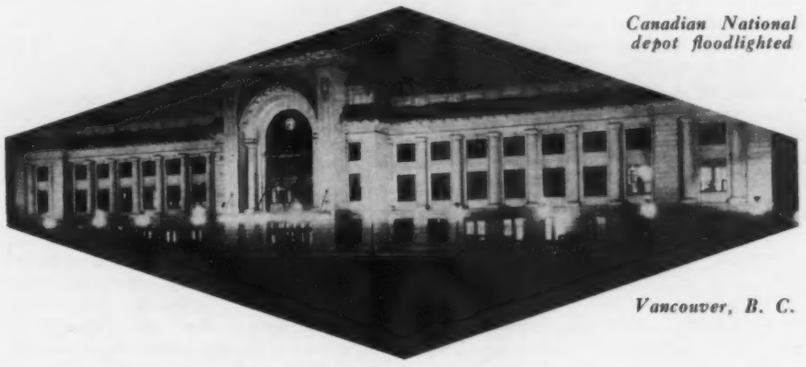
In so far as dealer activities in our territories are concerned, this could be improved. We feel that co-operation with the utility has been greatly increased during the past year, and yet we feel that the dealer is not making

KILOWATT-HOURS SOLD TWELVE MONTHS ENDED NOVEMBER, 1930

Coast Counties Gas & Electric Company

CLASSES BY TOWN	1930	1929	Increase	Per Cent	Number of Consumers 1930	Number of Consumers 1929	Consumption per Consumer 1930	Consumption per Consumer 1929
Residential light	2,069,688	2,909,315	839,627*	28.86*	6,372	7,723	325	377
Combination service (minor)	3,214,939	1,801,823	1,413,116	78.43	6,810	4,959	472	363
Combination service (major)	4,963,841	3,909,422	1,054 419	26.97	1,587	1,338	3,128	2,922
Heating and cooking	1,372,250	1,057,088	315,162	29.81	271	253	5,064	4,178
Commercial light	4,666,753	3,733,603	933,150	24.99	2,506	2,371	1,862	1,575
Agricultural power	17,878,176	14,923,860	2,954,316	19.80	1,344	1,238	13,302	12,055
General power	14,120,995	13,242,912	878,083	6.63	740	751	19,082	17,634
Inter-company sales	562,983	696,640	133,657*	19.19*	3	3	187,661	232,213
Street lighting	1,059,632	963,931	95,701	9.93	38	31	27,885	31,095
Misc. municipal sales (power)	745,115	671,098	74,017	11.03	79	67	9,432	10,016
Misc. municipal sales (light)	178,862	197,054	18,192*	9.23*	105	91	1,703	2,165
Total	50,833,234	44,106,746	6,726,488	15.25	19,855	18,825	2,560	2,343

* Decrease.



Canadian National depot floodlighted

Vancouver, B. C.

all the effort possible to promote the sale of electrical merchandise. This has proved to be quite true especially during the last year, in which most utilities on the Coast have made but very little effort towards merchandising electrical appliances. Dealers should always be given a great deal of consideration and it is towards this end that our company is working in particular, with no thought, of course, of going out of electric appliance merchandising.

Range Saturation Above 46 Per Cent

By L. W BRAINARD
Sales Manager, Idaho Power Company

HAVING no large cities or industries, the chief load-building possibilities in the territory served by the Idaho Power Company are found in the domestic and rural fields. Electric ranges and water heating installation sales were the principal features in the 1930 commercial program, which was completed with very satisfactory total accomplishments.

The following tabulation gives the major appliance quotas as set up for the year and the results accomplished:

	1930 Sales		
	Company	Dealer	Total
Ranges	3,379	358	3,737
Water-heating installations			2,258
Refrigerators			977
Mazda lamps			$39,518.78
Lamp sales per lighting customer			1.06
Average merchandise sales per residence customer			29.59
Ranges sold (including dealers) per 100 residence customers			12.01
Cooking customer increase over 1929			2,404

	Per Cent
Cooking saturation (Sept., 1929)	41.52
Cooking saturation (August, 1930)	46.49
Increase	4.97
Water-heating installations per 100 residence customers	7.26
Water-heating customer increase over 1929	1,273
Water-heating saturation (August, 1929)	13.54
Water-heating saturation (August, 1930)	16.45
Increase	2.91

A feature of our 1930 sales program put in practice for the first time was the matter of setting our quota of ranges to show all ranges sold in the territory, including our own stores and dealers. As is indicated by the above tabulation, progress was accounted for and reported on this same basis. In past years, urging our own organization to reach a definite range quota, irrespective of dealers, resulted, in many cases, in competition with dealers, whereas, during 1930, ranges sold by dealers were appreciated by our own organization, as credit was given on quota accomplishment the same as for ranges sold through our own stores. In actual practice it was found that on this basis our activities helped the dealers to make sales and their efforts helped us, so that business was stimulated for both and the net result was a higher development than would otherwise have been possible.

Above: Ground heating by means of bare wire in dirt-filled trenches has been developed by the Southern California Edison Company Ltd. to increase crop yields. Below: Type of sign used by Puget Sound Power & Light Company

The excellent result secured by the application of this quota and sales accounting method has led us to establish the same arrangement in regard to refrigerator sales for the year 1931.

Maximum effort during the year was put on the sale of water heating installations, and while the foregoing tabulation shows that water heating customers were increased only 1,273 as a result of 2,258 water-heating installations, the remainder of these were sold to former water-heater customers who had been using bare tanks or unsatisfactory installations. These were as important as sales to new customers, or even more so. Of the 2,258 water-heating installation sales shown in the above tabulation, 527 were Idaho farm water heaters described in former issues of ELECTRICAL WEST.

Material progress was made during the year 1930 in the increase in the number of residence customers being served on combination or one-meter rates.

Number of combination-rate customers, 1929	8,382
Number of combination-rate customers, 1930	11,602
Increase	3,220

Particular effort has been put on our combination-rate activities, inasmuch as it is felt these rates are a material factor in increased kilowatt-hour sales. The combination rates make it possible and logical for cooking and water heating customers to leave their electric ranges and water heaters connected throughout the winter season although they do not contemplate using them. The fact that this equipment is left connected avoids the expense of seasonal disconnects; experience shows that for convenience sake and quick operation a great many kilowatt-hours are used.

As a result of our merchandise and other load-building activities, pleasing increases were made in domestic kilowatt-hour sales, as shown by the following tabulation:

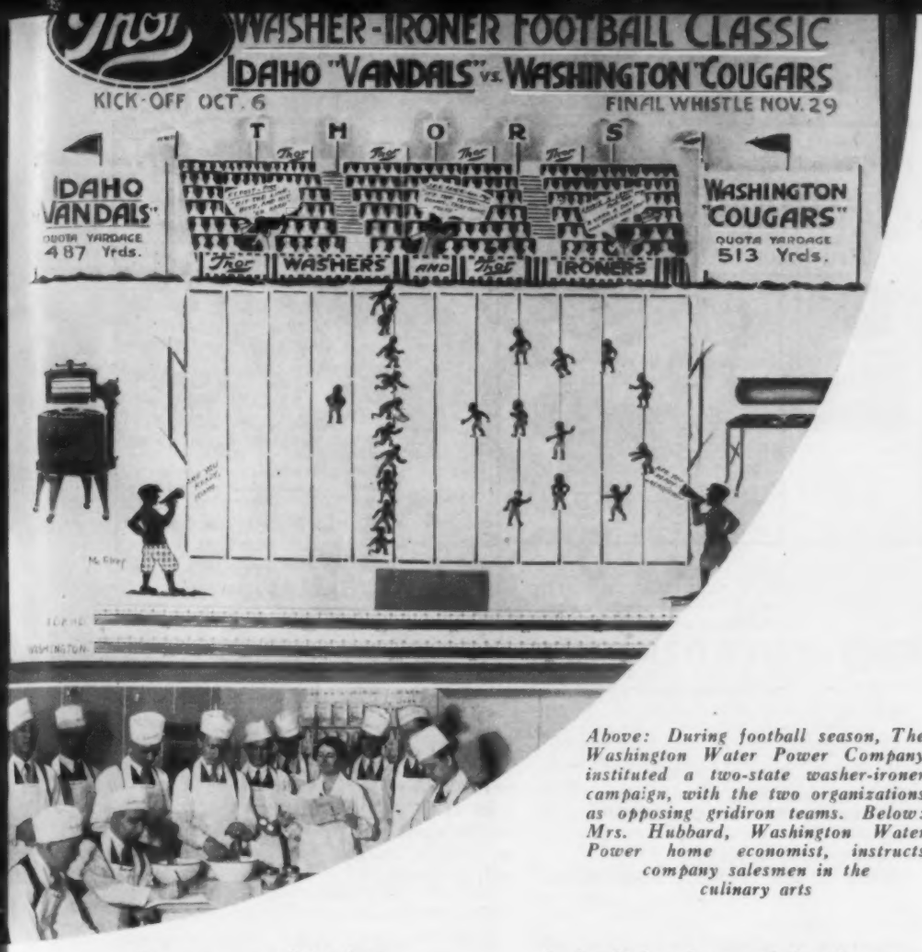
Average residence customers, 1929	28,909
Average kw.-hr. sales, 1929	1,252
Average residence customers, 1930	31,120
1930 average kw.-hr. quota	1,350
Average kw.-hr. sales, 1930	1,447

The following tabulation shows the quotas of major appliances and activities as set up for the year 1931:

Item	1931 Quota
Ranges (including dealers)	3,740
Water-heating installations	2,350
Refrigerators (including dealers)	1,450
Mazda lamps per lighting customer	$1.00
Average kw.-hr. sales per residence customer	1,600

During the year 1930, 1,263 rural customers were connected.

Co-operation between the rural service department and dealers in the territory, it is felt, has resulted in maintaining good dealer relations and the combined effect of the rural service department and dealers has resulted in contributing a very material portion of increased load and revenue.



Above: During football season, The Washington Water Power Company instituted a two-state washer-ironer campaign, with the two organizations as opposing gridiron teams. Below: Mrs. Hubbard, Washington Water Power home economist, instructs company salesmen in the culinary arts

Commercial Lighting Builds Load

By H. A. VAN NORMAN

General Manager, Los Angeles Bureau of Power and Light

GENERALLY the year was very satisfactory in the development of our domestic appliance load and in results obtained from our illuminating consulting service in increasing the average and beneficial use of electric lighting for commercial enterprises. Our specialized activities in the development of commercial and industrial heating load have also produced encouraging results.

Our plan of dealer co-operation was first tried out in 1929 by an intensive program to promote the use of electrical refrigeration. This plan provides assistance by the utility to the dealer, our part consisting of intensive advertising and the development of prospects by a specialized sales force, without, however, acting in competition with the dealers, who obtain their usual net profit on all sales. We, of course, secure our profit through the increased sale of kilowatt-hours.

Encouraged by the refrigerator campaign, we inaugurated a similar campaign along slightly different lines in 1930 to develop the electric range load, which has resulted in 30 dealers in nearly every section of the city now carrying stocks and aggressively merchandising, where only four or five formerly attempted displays. All things considered, this 1930 campaign has resulted satisfactorily, particularly in developing the use of electric ranges in large areas of moderate buying power in the city, whereas heretofore such use has been confined largely to the more exclusive residential districts.

Our plans are not definite for 1931, although the momentum of our 1930 campaign is continuing to furnish us electric range prospects in encouraging numbers.

The following tabulation will give statistics as to our growth in 1930 as compared with 1929:

	June 30, 1929	June 30, 1930
Meters—all classes	253,139	259,937
General power load	321,854.98 hp.	346,742.79 hp.
Residential, major appliances only	12,504.32	15,447.35
Street lighting	20,330.58	21,607.17
Other lighting (commercial and domestic)	471,016.39	489,216.19
Total system connected load	825,706.27 hp.	873,023.50 hp.

During 1930, 531 ranges were added to our system. No quota has been set for 1931. Water heaters numbering 101 were added during 1930 and no quota has been set for 1931. No reliable figures on refrigerator sales are available. For the past four years, the average kilowatt-hour consumption for domestic use has increased from 398 in 1927 to 443 in 1928, 475 in 1929, and 521 in 1930.

Plan Equal Activity in 1931

By FRANK WEISS

Manager, New Business Department, Los Angeles Gas and Electric Corporation

WE DO NOT operate a merchandising section in our commercial department. Strictly speaking, our commercial department activities are confined to the solicitation of competitive business, maintenance of congenial relations with present patrons, and a concerted effort at load building through encouraging new and greater usage of electrical energy. Our achievements along this line during 1930 were very gratifying considering general business conditions, and we plan at least an equal if not an intensified continuation of this policy during 1931.

Growth in consumers and increases in connected load which we have enjoyed in the year just passed are:

Connected Meters	Light	Power	Total
Jan. 1, 1931	155,099	9,840	164,939
Jan. 1, 1930	150,400	8,854	159,254
Increase	4,699	986	5,685

Connected Load	Light Kw.	Power Kw.	Total Kw.
Jan. 1, 1931	246,824	113,665	360,489
Jan. 1, 1930	232,524	103,995	336,519
Increase	14,300	9,670	23,970

	Hp.	Hp.	Hp.
Jan. 1, 1931	330,863	152,366	483,229
Jan. 1, 1930	311,695	139,404	451,099
Increase	19,168	12,962	32,130

Unfortunately our accounting system does not provide for a segregation of sales between domestic and commercial lighting and because of this no figure is available, since our territory is confined almost exclusively to metropolitan Los Angeles and our agricultural, mining and miscellaneous loads are negligible.

Increases in load through appliances include 1,417 kw. from 178 electric ranges and 106 kw. from 56 water heaters. Thirty-one of these were of the 1-kw. type installed in a single apartment job, which accounts for the low average increase in load. We have no sales of refrigerators to report.

Our advertising, since we do not merchandise, was clothed in terms to influence greater usage of electricity. New agencies and appliances were featured to accomplish this, and it is evident that the industry as a whole benefited from our campaigns.

Large project loads signed during the year 1930 were as follows:

Owner	Character of Building	Permit Value
Southern Cal. Edison Co.	Office building	$2,825,000
Title Guarantee & Trust	Office building	800,000
Stock Exchange Building	Office building	700,000
Fox Theater Building	Theater and offices	600,000
M. Feigenbaum	Apartment building	350,000
Brunswig Drug Co.	Warehouse and garage	300,000
Southern Cal. Telephone Co.	Addition to office building	182,000

Always an active merchandiser, San Joaquin Light & Power Corporation campaigned on the convenient, healthful, safe, and clean properties of the electric range

Appliance saturation in Montana Power territory is high

Left: Utah Power & Light Co. offers free transportation

Sale of Appliances Has Been Slow

By J. C. PLANKINTON
Sales Manager, Northwestern Electric Company

INFORMATION concerning the number of consumers of each class on our lines and the connected load for each, comparing figures of 1929 with those of 1930, is contained in the following table:

	Domestic Consumers		Coml. Lighting Consumers		Industrial Power Consumers		Miscellaneous Consumers		All Classes Consumers	
	No.	Con. Load	No.	Con. Load	No.	Con. Load	No.	Con. Load	No.	Con. Load
Dec. 31, 1929	23,454	52,758 kw.	4,279	32,485 kw.	1,231	67,155 kw.	58	1,294 kw.	29,237	157,188 kw.
Dec. 31, 1930	25,004	58,710 kw.	4,404	36,528 kw.	1,231	67,155 kw.	58	1,294 kw.	29,237	157,188 kw.

Very consistent has been our growth in average kilowatt-hours per residential consumer. A curve plotted from the accompanying data would resemble closely a curve of our growth in range connections.

While the sale of electrical appliances has been slow for the past year, we are very hopeful, indeed, of a slow recovery in 1931, and we plan a concentration of our efforts on the sale of major current consuming devices such as electric ranges, water heaters, and refrigerators.

Average residential consumers	1922	1923	1924	1925	1926	1927	1928	1929	1930
All districts	455	489	559	661	816	938	1,019	1,058	1,150
Portland only			580	665	857	1,015	1,130	1,208	1,315

Road Show Enlists Power Employees

By R. E. FISHER
Vice-President in Charge of Public Relations and Sales, Pacific Gas and Electric Company

BECAUSE our 1931 sales plan, and the method we are employing to carry it both to our 16,000 employees and their families and to the dealers in our territory, is unique in many respects, a full article describing it in detail has been promised for the next issue of ELECTRICAL WEST. Suffice it to say that we are turning to an old time institution, the one-night-stand show, to carry the plan into each of our divisions. To these performances are invited every employee and his family. Thus we hope to augment our regular sales force of 500 trained salesmen with 16,000 employees and their families, and several hundred dealers will be told of our dealer co-operative merchandising plan in a second set of meetings in each division.

In the San Francisco and Oakland divisions a straight commission on kilowatts connected either by dealers or by the company will be the basis of pay. In the outlying districts our salesmen will be paid a commission on each kilowatt of range, water heater and major air heating which dealers sell, thus stimulating working with dealers. Our quotas for 1931 all contemplate the dealers selling a large proportion of the merchandise specified.

Summarizing some of the 1930 attainments and 1931 goals, the following figures condense both into short space. Further details, as has already been noted, will appear in March.

The number of appliances sold by the company in its merchandising activities, together with dealer sales, both in 1930 and contemplated in 1931, are as follows:

No. of Units	Sales 1930	Quota 1931
Ranges (company and dealers)	5,759	6,000
Water heaters (company and dealers)	2,388	2,500
Major air heaters (company and dealers)	2,292	2,500
Auxiliary air heaters (company only)	6,697	5,000
Floor lamps and cookers		6,000

Connected load signed during 1930 by classification and quotas for 1931:

	Sales 1930* Kw.	1931 Quota Kw.
Street lighting	1,258	1,428
Commercial lighting	8,841	7,160
Industrial electric heating	4,795	7,500
Commercial heating and cooking	7,551	6,000
Agricultural	18,855	20,500
All others	150,934	97,500

* These figures represent twelve months for Pacific Gas and Electric Company, but only seven months of Great Western Power Company, merged with the former during the past year.

While we sell no refrigerators, from distributors in our territory we have obtained the following figures:

1930 sales 16,500. 1931 quota 23,278

Sales of kilowatt-hours by various classifications during 1930, as compared with 1929, and showing percentages of increase or decrease, may be gaged from the following figures. Figures for eleven months only of both years are given, as the twelve-months figures for 1930 are not yet completed. The italics denote a decrease.

Our domestic average kilowatt-hour consumption last year increased from 628 to 697, or 71 kw.-hr.

We have estimated that our program for 1931 will create a market for $21,483,000 in current consuming equipment, and $2,457,000 in contractors'

	Total Kw.-hr. 1930	Total Kw.-hr. 1929	Per-centage
Street lighting	43,717,736	36,363,878	20.22
Public building lighting	12,602,673	11,128,494	13.25
Commercial lighting	123,412,143	118,038,509	4.55
Domestic lighting	204,539,845	179,455,666	13.98
Commercial heating and cooking	12,928,211	11,438,911	13.02
Domestic heating and cooking	78,026,833	66,871,420	16.68
Mining power	90,284,895	89,312,088	1.09
Agricultural power	241,620,042	224,119,747	7.81
General power	664,813,205	696,923,534	4.61
Railway power	259,767,216	258,831,542	0.36
Resale power	104,207,370	97,831,348	6.52
Total sales to consumers	1,835,920,169	1,790,315,137	2.55

wiring materials, exclusive of labor. Of such equipment we expect to sell $4,465,000 in appliances, on an expense budget for electrical sales of $605,421, or at a revenue per dollar of sales cost of $7.37.

Besides the appliance quotas given in the foregoing we expect to build up an industrial load during 1931 of 10,050 hp. in electric heating, 330 hp. in floodlighting, 1,760 hp. in interior lighting and 91,000 hp. in power. Our commercial building quotas in co-operative selling contemplate increased load of 8,050 hp. in hotels and restaurants, 4,320 hp. in floodlighting and street lighting, 5,290 hp. in interior lighting, and 39,000 hp. in general power. In agricultural power we hope to increase by 5,650 hp. in replaced gas engines, 16,525 hp. in new pumping plants, 1,535 hp. in dairy milkers, coolers, sterilizers, etc., 1,795 hp. in poultry uses, and 2,095 hp. in dehydration, or a total of 27,600 hp.

By utilizing what we consider to be our three big sales forces, namely our employees and their families, our friendly dealers, and our sales force, we hope to prove that the year 1931 will reward hard work and friendly relations with and between the trade, the public and ourselves.

Shows Increase in Appliance Sales

By V. H. MOON

Sales Manager, Pacific Power & Light Company

ANY growth in customers shown below is growth in territory which remains in the Pacific property after the transfer of the Idaho districts to the Washington Water Power Company.

Total customers as of Dec. 31, 1930	48,776
Total customers as of Dec. 31, 1929	46,892
Increase	1,884
Residential customers as of Dec. 31, 1930	40,748*
Residential customers as of Dec. 31, 1929	38,826

* This includes 7,844 farm customers; we have no comparable figure for 1929.

Our commercial lighting department reports 228.6 kw. in commercial lighting load added and a resulting estimated annual revenue of $18,288.

While 1930 was a generally unsatisfactory year for the sale of all merchandise in quantity, we actually increased our volume of domestic appliance sales over 1929 in the same territory, i.e., eliminating the Idaho properties transferred to the Washington Water Power Company.

Our sales for 1930 were	$986,650.00
Our sales for 1929 were	952,967.89
Increase	$ 33,682.11
Sales per residential customer for 1930	$24.45
Sales per residential customer for 1929	24.80

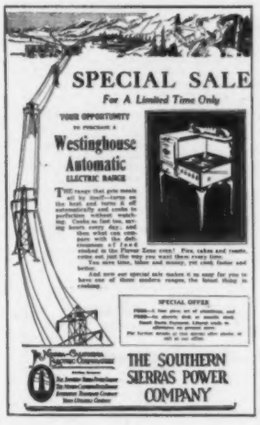
Gross sales, and sales per customer, shown above, are net figures, that is, reverts and adjustments have been deducted before averages were computed.

Our 1931 schedule of commercial activities will be called a development program and will be divided into four divisions: Domestic appliance, commercial appliance, lighting, and rural electrification. In the domestic appliance division we have set up a quota of $1,100,000 in net sales.

All districts will be divided into territories, one man to a territory. Each territory will receive its own assignment of quota. A great deal of attention will be paid to dealer co-operation, particularly in the sale of ranges and sales, while merchandise sales figures will be secondary. In the domestic field we have reached 1,170 kw.-hr. per customer during 1930 and are aiming at 2,000 kw.-hr. sales per customer by the end of 1934.

In the commercial lighting division we are adding to our department and will for the first time lay out a program of lighting development with quotas and revenue and kilowatt-hour sales in the different lighting fields. In the commercial appliance division, which will include apartment house sales of ranges and refrigerators and all other commercial sales of heavy-duty cooking equipment and commercial refrigeration equipment, a program, somewhat sketchy, will be outlined for the coming year. In the rural electrification division it is planned to add more men

Typical 1930 advertising of The Southern Sierras Power Company. Right: National advertising to build the West industrially is being used extensively by power companies of this territory; P. G. & E. is a large space-user



Spreading the combination washer-ironer gospel, the Pacific Power & Light Company conducted successful campaigns which helped build average domestic consumption to 1,170 kw.-hr. annually. They expect 2,000 in 1934

and to direct their efforts entirely to the promotion of strictly farm uses. The sale of standard domestic equipment of farm customers will be handled outside of the rural electrification department.

Every Department Ahead of 1929

By G. B. BUCK

General Commercial Manager, Public Service Company of Colorado

RESULTS in 1930 were satisfactory to the Public Service Company of Colorado; in gross merchandise sales we were about 8.5 per cent better than in 1929. In almost every line, and especially in the load building items such as ranges and refrigerators, our electric merchandise sales showed marked improvement, and we have budgeted 1931 for the biggest year in our history. The electrical achievement is especially gratifying, for we operate combination gas and electric facilities almost throughout our territory, and have competition where we do not.

Our average sale per customer during 1929 was $13.66; during 1930, $15.35. Average kilowatt-hour sale per domestic customer was 427.5, an increase of more than 40 kw.-hr. for the year. In view of business conditions in mining territories of the state, and considering that more than 100,000 customers are involved, this figure is satisfactory.

Surprisingly, every individual sales department and division was ahead of the previous year in production, and revenue increases, while not up to the budget, were decidedly better than in 1929. The unit cost per dollar of production was very slightly increased during 1930. The domestic load was the life-saver and we believe that a continuation of an intensive sales program, looking forward to improvement in domestic consumption, is the means of weathering the so-called "depression" storm.

As for large loads added, the company includes street lighting installations totaling 328 standards of 300 watts each; the Merchants baseball park installation of 298 kw. and the Denver University football stadium load of 85 kw. These jobs were all engineered by our lighting specialist.

Power additions are 250 hp. at the Chain O'Mines in Idaho Springs, with an estimated annual revenue of $10,000; power and lighting contracts for a new Denver theater, with $10,000 annual revenue; and the Continental Oil refinery, with $30,000 annual revenue.

Certain tabulations, which best show our activity during the year, follow:

	Increase in Electric Customers 1930 Over 1929	Increase in Electric Customers 1929 Over 1928
Domestic	1,322	3,017
Commercial, metered	485	39
Commercial, flat	15	28
Power	261	284
Total increase	2,083	3,368

Total sales for 1930 on heavier appliances are:

	1930 Sales	1931 Budget
Electric ranges	802	1,232
Electric water heaters	20	46
Domestic refrigerators	1,993	2,035
Com'l. refrigerators	104	200

Kilowatt-hour sales per customer are broken down into the various classes:

Year	Domestic	Commercial Metered	Commercial Flat	Power
1927	333.4	2,975.3	3,168.8	21,781.3
1928	354.0	2,851.9	4,405.1	20,866.8
1929	387.0	3,051.6	4,144.1	21,150.8
1930	427.5	3,127.4	3,928.6	21,065.8

Power revenues in our mining territory are off quite materially, particularly at Leadville, Salida, Idaho Springs, and other mining centers. Agricultural development and production for 1930 was highly satisfactory, even though crop prices have not been up to par. Volume sales, in a measure, offset these results, and a tabulation of our agricultural wealth for 1930 will be satisfactory.

Our sales plans for 1931 contemplate intensive drives on refrigeration and electric ranges. We have already begun our part in the N.E.L.A. refrigeration drive and expect to sell 5 per cent of our customers this year. Right now we are working on a water heating rate which we hope will help us attain better results in water heater merchandising than we anticipate.

Merchandise Sales Approach Bogey

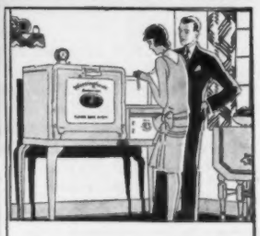
By W. E. HUDLESON

Assistant to General Sales Manager, Portland General Electric Company

RECLASSIFICATION of industrial light and power customers since last year makes figures on customer growth difficult to obtain, but on Dec. 1, 1930, 91,457 domestic customers, 8,626 commercial customers, and 339 industrial customers were receiving service. Increases over 1929 were: Domestic, 1,637; commercial, 266. Industrial customers were included in other classifications in 1929, so no comparison may now be made. Totals for the system, including Portland, Wil-

In Long Beach, one of the Southern California Edison Company's co-operative dealers has added a lunch counter. Food —from bolts to nuts —is novel and the dealer finds it profitable. The hardware store is fast becoming a rival of the drug store

The advertisement is one of a group used in a fruitful range campaign



Are you as proud as they?

Are you among the 314 home wives who have proud husbands sharing your pride in a new electric range — just installed during our special low offer—which by the way closes May 15th?

If not, *and* you simply must pension off that nasty old stove, you'd better hurry for two very good reasons—first, our low price and terms will soon be withdrawn; and second, so great has been the demand for these new models that we have had considerable difficulty in getting them for delivery.

Westinghouse

The Electric Range with the automatic "Flower Zone" Oven.

only $7.00 down – $7.00 monthly (until May 15th only)

MOUNTAIN STATES POWER COMPANY

lamette Valley, Tualatin Valley, and Vancouver divisions, are 103,790 consumers, an increase of 2,092. No record of connected load is kept, but estimated increased kilowatt-hour consumption over 1929 is: Domestic, 10 per cent; commercial, 9.8 per cent; total, 9 per cent.

Merchandise sales of approximately $500,000 for the year were somewhat less than for 1929 and considerably below the 1930 bogey. None of a number of campaigns during the past year reached the established quota, although during the "All-Electric Kitchen Campaign," held from Oct. 6 to Nov. 22, 202 ranges, 56 refrigerators, and 32 water heaters were sold.

Large industrial loads connected during the year include: Western Board Products Company, Salem, 75 kw.; Reid-Murdock Company, Salem, 200 kw.; Fir Tex Insulating Board Company, St. Helens, 3,900 kw.; Linde Air Products Company, Portland, 155 kw. Large loads anticipated in 1931 include: One five-story and one twelve-story office building; a $500.000 public market; approximately 2,000 kw. load addition to St. Helens Pulp & Paper Company; approximately 700 kw. load addition to Oregon Pulp & Paper Company, Salem.

Domestic Revenues Show Increase

By H. J. GILLE

General Sales Manager, Puget Sound Power & Light Company

PARTIAL figures relative to our 1930 activities reveal a moderate increase in total customers served by the company and a fairly successful merchandising program. At the end of 1929 116,165 residence customers were being served, while at the end of 1930 this number had grown to 124,933, an increase of 8,768. The total of residence customers at the end of the year is about 2,000 more than the average for the year which is used for all data.

Average kilowatt-hour consumption per residence customer in 1930 was 1,109; in 1929, 954; in 1928, 851; in 1927, 765. The increase in current consumption for the year averages 155 kw.-hr. more than in 1929, a 16 per cent increase.

Domestic revenues show an increase of 12.6 per cent for the year, commercial lighting revenues showed a substantial increase also, though not as large as the domestic, industrial power revenue decreased slightly, farm revenue showed a substantial increase because of our continued activity in this direction, agricultural power returns for irrigation pumping had a small increase, mining and railway power revenues were substantially the same as for 1929, and miscellaneous power revenue showed some increase.

Our program for 1931 includes concurrent N.E.L.A. months, and in addition to that, a spring and a fall range campaign of three months each. Our plans for 1931 do not differ materially from the program we have followed for the last few years. This program includes our doing everything we can to co-operate with retailers, jobbers, manufacturers, and others in a co-operative manner to develop the use of electric service in all of its ramifications.

Our concurrent campaigns will include active dealer co-operation in every way possible during 1931, and we hope that more appliances will be connected to our system than in any previous year.

On March 1, 1930, we reduced our lighting rates, and all rates which were over 8 cents primary were reduced to 8 cents. On Aug. 1, 1930, all rates which were over 7½ cents were reduced to 7½ cents. Our maximum primary lighting rate in all districts is 7½ cents at this time.

During the year, we also reduced the primary step of our industrial power rate, inside incorporated cities and towns, from 4½ cents and 5 cents per kilowatt-hour to 4 cents. A further rate reduction for lighting has been announced to become effective March 1, 1931; also a still further reduction to become effective in 1932, whereby the maximum primary lighting rate in our entire territory will be 5½ cents per kilowatt-hour.

B.C. Electric STORES
Ideal for Summer Cooking
ELECTRIC COOKING PLATES
Priced from $2.50
NOW'S the time to buy an economical and convenient electric plate. Many real bargains in 1930 cooking appliances are now shown at B. C. Electric Stores.
Illustrated above are three models which we believe will prove most popular this season.
The single burner plate is practically indestructible, with a genuine range type, speedy element of 660 watts. Heavy enamel finish in French grey. Easy to keep clean.
Now only $2.50
The two-burner, two-switch plate on the right is a Canadian-made Superior hotplate, in the same finish as the one-burner plate. Both burners operate separately, having individual switches. $5.25
The two-burner, one-switch plate is unique. It has been specially made to B.C. Electric requirements —finished in heavy, gleaming nickel. Both elements operate separately or together—use the combined heat of both elements may be concentrated in the one element, producing a speedy and intense heat. 1,100 watts! $8.00
Any of these hotplates, or any of the many other interesting cooking and table appliances shown at B.C. Electric Stores, are available on very EASY TERMS.
BRITISH COLUMBIA ELECTRIC RAILWAY CO. LIMITED

Los Angeles' Bureau of Power and Light has an active commercial lighting organization. At the top is an outdoor market after the engineers had installed proper lighting, while below it is the market before. At the bottom is a window of the Pacific Power & Light Company. The advertisement is from a series on small appliances

Fine Load-building Achievement

By R. L. SEWELL

Merchandising Manager, Salt River Valley Water Users' Association

THIS year has been one that we were proud of from the load-building standpoint. At present we have on our lines 3,458 customers, with consumption of 4,814,544 kw.-hr. for the year. In checking this, we find the consumption to be 1,509 kw.-hr. per customer.

During the year 1930, we sold 283 ranges. I trust, during the year 1931, we will sell 300 ranges.

In 1930 we sold 41 water heaters. For 1931, we have placed our quota at 50 water heaters.

Refrigerators for 1930 exceeded our quota nearly 200 per cent. During this period we sold 133 refrigerators, and can credit this to special refrigerator campaigns held in February and April. Our 1931 budget is 150 units.

Our best campaign was conducted with the Westinghouse Electric range during the months of January and February. Placing what we figured

would be a large quota of 40 ranges for January, we sold in three weeks the 40 and decided to run the campaign through February and placed during these two months 98 ranges on the lines. Considering the number of customers connected as 3,074, approximately 3 per cent were sold ranges during this campaign.

Show Gain In Customers and Load

By A. E. HOLLOWAY

Superintendent Commercial Department, San Diego Consolidated Gas & Electric Company

SATISFACTORY progress has been made in the electrical industry in San Diego County during the past year. Approximately 1,997 electrical customers and 7,959 kw. of connected load have been added to the lines of this company, an increase of about 2.9 per cent in the number of customers and 5.9 per cent in the connected load. Our lighting, cooking and heating load shows an increase for the year of approximately 8.6 per cent and our power load a gain of about 3.6 per cent.

The average kilowatt-hour consumption per residential customer was 553 as against 469.3, an increase of 11.4 per cent over 1929.

Our merchandising department sold a total of approximately 10,600 appliances—electric irons as usual heading the list with 1,307. The total number of appliances sold during 1930 was slightly less than in 1929. Approximately 300 electric signs were installed during 1930.

During October, our third annual employees' lamp campaign was carried on and 55,192 lamps were sold by our employees. This was a gain of 61 per cent over the number sold in the 1929 campaign. As in previous years, a major and a minor appliance were featured each month in an especially emphasized campaign.

Red Seal activities were carried on as usual during the year and 28 certificates were awarded. While less than our 1929 record, this total is in satisfactory proportion to the decrease in the building permits.

It is anticipated that during 1931 commercial activities will increase, primarily due to the lowered building costs and consequent increase in the number and size of buildings.

Record Year in Connected Load

By E. G. STAHL

Sales Manager, San Joaquin Light & Power Corporation

IN THE following tabulation will be found the 1930 bogey, business connected during 1930, and the new business sales bogey for the year 1931 in accordance with the four major classifications of electric application.

	1930 Bogey Kw.	1930 Business Connected Kw.	1931 Bogey Kw.
Lighting	10,130	13,642	11,000
Combined domestic and commercial heating and cooking	27,545	23,933	22,500
General power, industrial and oil field	18,665	16,510	14,000
Agricultural power	23,660	26,338	22,500
Total kw.	80,000	80,423	70,000

The new business connected load of 80,423 kw. for 1930 exceeds the amount of any previous year and represents 0.82 kw. of new business load per system consumer.

Except for the record year of 1930, the 1931 bogey of 70,000 kw. is larger than that set for any previous year. We have every reason to believe we will make, if not exceed, this amount.

Results were very satisfactoy in all classes of lighting during the year. The bogey of 10,130 kw. was exceeded by 3,511 kw., or 34.66 per cent, reflecting the best lighting year in the history of the company.

Our system bogey for Red Seal promoted under this department will be 275 installations for 1931.

Two special heating campaigns were carried on during the year with the following results:

	Kw.
Air heating	4,135
Commercial cooking and heating	1,100
Industrial heating	1,344
Total	6,579

This load represents an increase of 25 per cent over the results of 1929.

During 1931 we plan to concentrate on auxiliary air heating (a heater for every bathroom, kitchen, and nursery), commercial cooking and heating, and sterilizers. Our bogey has been set at 7,000 kw. for the year.

A total of 16,510 kw. was connected during 1930 as follows: Industrial power, 8,000 kw.; oil field power, 8,510 kw.

Industrial power covers a wide range of applications, principal among which is the cotton industry which contributed some 1,500 kw. at gins and cottonseed oil mills.

Oil field power load consisted of drilling rigs, compressors, pipe-line pumping, shipping and loading pumps, water wells, and oil-well pumping. Curtailment in the oil industry affected our load somewhat in this classification.

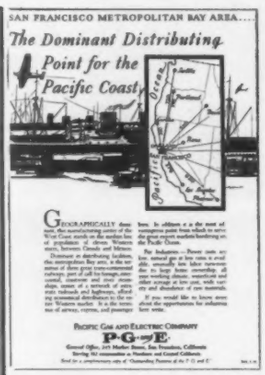
Agricultural electrification had an unusually good year in 1930. All classes of service were substantially increased, interesting among which was the replacement of 1,129 gas engines with 10,515 hp. of electricity.

Major objectives this year will be to diversify our agricultural load and to develop additional business on existing lines.

Greater efforts will be made throughout the year to secure employee cooperation in sales promotion. We are introducing a "Sales-tip Plan" open to all employees with substantial cash prizes offered by each district to stimulate interest in new business sales. All company employees are being contacted at group meetings at which the sales plan for the year is being outlined.

SYSTEM TABULATION

	New Business Sales	Sales per Consumer	Kw.-hr. Consumption per Dom. Consumer
1926	57,790	0.75	553
1927	56,595	0.68	641
1928	61,089	0.73	745
1929	79,997	0.88	834
1930	80,423	0.82	916
1931	70,000	0.68	990


SAN FRANCISCO METROPOLITAN BAY AREA
The Dominant Distributing Point for the Pacific Coast
PACIFIC GAS AND ELECTRIC COMPANY
P·G·&·E

Another of the series of P. G. & E. advertisements designed to interest industrialists in the company's territory

Left: Public Service Company of Colorado celebrated its 61st anniversary with a sale

$9,000,000 Budget Given City Light

By J. D. Ross

Superintendent of Lighting, City of Seattle

FIGURES indicating the progress and work of the Lighting Department of the City of Seattle include:

Increase in plant load as shown by yearly peak:

1930	95,000 kw.
1929	90,000 kw.
Increase	5,000 kw., or 5.5%

Increase in kilowatt-hours generated:

1930	384,812,680 kw.-hr.
1929	364,959,930 kw.-hr.
Increase	19,852,750 kw.-hr., or 5.4%

Increase in sales ((11 months):

Residence lighting—

1930	79,963,561 kw.-hr.
1929	74,837,152 kw.-hr.
Increase	5,126,409 kw.-hr., or 6.3%

Business lighting (commercial)—

1930	48,077,213 kw.-hr.
1929	44,799,758 kw.-hr.
Increase	3,277,455 kw.-hr., or 7.4%

Commercial power—

1930	69,397,399 kw.-hr.
1929	64,824,853 kw.-hr.
Increase	4,572,546 kw.-hr., or 7.1%

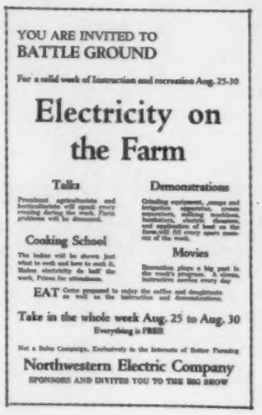
Outstanding events of the year for City Light were the completion of the Diablo Dam on the Skagit project, 389 ft. high and impounding a storage capacity of 90,000 acre-ft. of water; and the ground breaking for the new City Light Tower, a 26-story building now under construction on property owned by City Light.

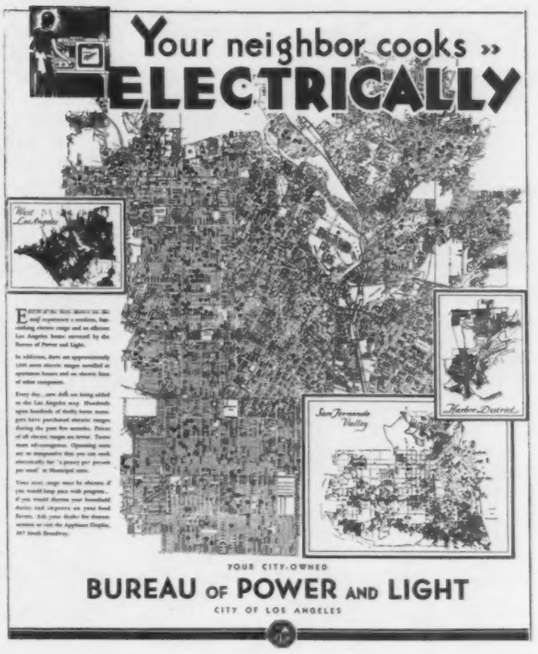
Seattle's prosperity and employment program for 1931 will be materially aided by its Light Department in that a total budget of $9,000,000 has been allotted for operation, construction, and development during the new year. Projected work of major importance includes the survey of the Ruby watershed on the Skagit and the clearing of the Ruby Basin.

Operating units to be constructed in 1931 include the new Diablo power house, below Diablo Dam; the Diablo transmission lines, and the new city substations. Incidentally, 1931 will witness the completion of the new City Light downtown substation and headquarters and offices in the new City Light Building, a project made possible by the growth and success of the department.

Right: This advertisement was read because of the inherent urge to spot one's home on any map

Below: Special farm demonstrations help the farmer to get better crops and use more electricity





Average domestic consumption rose to 733.92 kw.-hr. per consumer. Load growth in all fields is included in the following tables:

	Kw.-hr.
Home customers, 1930	5,639,612
Home customers, 1929	4,953,166
Increase over 1929	686,446
Farm customers, 1930	1,150,842
Farm customers, 1929	965,179
Increase over 1929	185,663
Commercial consumption, 1930	11,837,581
Commercial consumption, 1929	11,102,972
Increase over 1929	734,609
Industrial consumption, 1930	19,352,745
Industrial consumption, 1929	12,172,776
Increase over 1929	7,179,969

We feel that improved conditions will make our increased 1931 budget easily attainable.

1931 Budget Easily Attainable

By O. S. Clifford

Sales Manager, Sierra Pacific Power Company, Reno

FIGURES on industrial, mining and railroad power loads are not available at this time, but data on hand show a growth in consumers and an increase in domestic kilowatt-hour consumption for 1930 for the Sierra Pacific Power Company. Home customers increased in number 1,124, and 72 farm users were added to our lines.

Merchandising Helps Boost Revenues

By Geo. T. Bigelow

Assistant General Agent, The Southern Sierras Power Company

LIGHTING load, both domestic and commercial, has made a very marked increase, the revenue running ahead of last year about 11 per cent for the first eleven months, while within this time heating revenues went ahead about 34 per cent. Our power revenue has been down somewhat. This can easily be traced to rather definite conditions, and is not a reflection of the general situation on our system. (For instance, silver has dropped to under 31 cents, which greatly affects the mining industry.) We have had a very satisfactory increase in the number of consumers.

Our merchandising has been the best of any year we have had, and this has contributed largely to our general increase in revenue. We have not varied our methods to any great extent, but are getting results from our past efforts.

There have been no spectacular loads signed up during the last year, and it is not our intention to make any radical changes in our organization set-up for 1931, or to vary to any marked degree our campaigns.

General conditions have been good on our system in 1930, and there is no reason for us to expect that they will be any worse in 1931, but rather that we can look forward to an improvement.

No Curtailment of Sales Activity

By W. L. Frost

Vice-president, Southern California Edison Company, Ltd.

EXPERIENCES of 1930 should convince all doubters that electricity is firmly established as an essential service. During this trying period, with its policy of general retrenchment, electric sales have been maintained and in some respects the figures for 1930 have exceeded those of 1929. It is interesting to speculate about these conditions and to seek the reasons for the rather surprising results during this off year.

With dwindling sales, merchants have sought to stimulate business by increased window lighting and electric signs. In the same way, competing filling stations, cafes, and markets have dressed up their places for night business. Industrial plants have been forced to make economies and have found some relief in the intelligent use

of electric motors, heating devices, and the like. Housekeepers with reduced allowances have done more of their own work with the aid of electric appliances. In every instance, electricity has proved its worth and has further established itself as something that cannot be omitted from any modern plant—home, factory, or store.

Our total increased connected load for 1930 is 9 per cent less than for 1929 but 14 per cent better than for 1928. The falling off for this year may be traced almost entirely to the quiet conditions prevailing in the industrial lines. Domestic load and domestic consumption have gone ahead steadily. The average domestic annual consumption was 573 kw.-hr. at the close of 1928; 640 kw.-hr. at the end of 1929; and in December of 1930 it stood at 682 kw.-hr.

Encouraged by this experience, the Southern California Edison Company has set its quotas for the new year at an average point of about 10 per cent above the results of 1930. We have maintained our momentum throughout the past year with no curtailment of sales activities or advertising and hence are prepared to take immediate advantage of the improved general conditions which are now in sight.

The following table summarizes Edison results for 1930 and quotas for 1931:

1930 Results		1931 Quotas
237,742	New horsepower exclusive of domestic appliances	240,000
330,975	Total new horsepower signed	350,000
23,500	New consumers	27,000
71,731	Industrial power (hp.)	70,000
9,959	Industrial heat (hp.)	12,500
39,197	Agricultural power (hp.)	40,000
51,259	Oil business (hp.)	47,500
65,596	Lighting—all classes (hp.)	70,000
10,158	Space heating (hp.)	10,000
1,524	Red Seal homes	1,800
93,233	New horsepower of domestic appliances	110,000
5,900	Ranges (No.)	7,500
1,105	Water heaters (No.)	1,600
1,725	Refrigerators (company sales)	2,000
5,000	Refrigerators (total estimated sales)	6,000
23,000	Small appliances (units)	25,000
$2,000,000	Merchandise sales	$2,402,100

Year's Business Is Nearly Normal

By CHARLES A. LUND

Superintendent of Power Sales, City of Tacoma, Department of Public Utilities

AS THE past year's business, from the standpoint of kilowatt-hour consumption, it reviewed, it has been a fairly good year, although certain phases of activities were considerably below normal. Industrial activity, in line with the general trend was below par and reflected itself in our year's business. However, as an offset against this loss, the commercial and residential fields showed a material increase, thus making the year's business more nearly normal.

Increased use of electricity in the homes is reflected in the average annual domestic consumption for the past three years: 1928—1,285 kw.-hr. 1929—1,337 kw.-hr., and 1930—1,494 kw.-hr. These figures include the use of domestic hot water heating, which is metered in combination with the lighting and cooking load.

Data below give a fair picture of the year's business:

Number of ranges connected, 684; total on lines, 7,903.

Number of water heaters connected, 399; total on lines, 4,891.

Increase in connected load:

Domestic	6,519 kw.
Commercial	905 kw.
Power	2,055 kw.
Heavy duty commercial cooking	657 kw.

(These figures do not include socket appliances.)

No outstanding or spectacular loads were connected, unless the connection of a 300-kw. traveling bake-oven can be considered as such.

Northwest power companies have made their rural sections most progressive electrically

During the year a joint "automatic flat iron" campaign, in conjunction with the contractor-dealers, met with very good success, a month's activity selling some 1,050 irons.

Our plans for this year contemplate the usual spring and fall range campaigns, and the stressing of hot water heating and auxiliary air heating, supplemented by active solicitation in the field.

Total Merchandise Sales Ahead

By P. M. PARRY

Vice-President, Utah Power & Light Company

DURING the year 1930 we carried on very aggressive merchandising activities, stressing in particular the three major appliances—electric ranges, electric refrigerators, and electric water heaters, carrying on these activities throughout the year since we have found that the sale of these appliances is no longer a seasonal matter, but may be carried on with practically as good results throughout every month of the year.

Due to these activities the following major appliances were sold by the company during 1930:

Electric ranges	3,615
Electric refrigerators	2,319
Electric water heaters	1,203

Quotas were set up for the year 1930 and then broken down in monthly quotas. These quotas were then subdivided in accordance with the territory and finally a monthly quota was set up for each salesman.

During 1930 our total merchandise sales amounted to approximately $1,750,000, an increase of approximately $75,000 over 1929. Although the increase in gross merchandise sales 1930 over 1929 was not large, we believe, however, that it was a job well done considering business conditions encountered at least in the latter half of 1930 and the fact that we made no changes whatsoever in our sales organization.

Our total merchandise bogey for 1931 has been set at slightly in excess of $1,900,000, with the following quotas

ELECTRIC LIGHTED CHICKS
Electric Warmed Drinking Fount
Electric Warmed Drinking Trough
STERILIZER UTENSILS
AN ELECTRIC STERILIZER
will pay for itself in short time by the difference in price of high grade milk and cream over ordinary milk and cream.
HOT WATER
COOLED MILK
PUGET SOUND
Power & Light Company
WHO WORKS FOR 1¢ AN HOUR?
PUGET SOUND
Power & Light Company

assigned for the three major appliances:

Electric ranges	4,000
Electric refrigerators	3,000
Electric water heaters	2,000

In addition to the appliances sold by this company, it is estimated that dealer sales in our territory amounted to 500 electric ranges and 2,500 electric refrigerators.

In 1929, for the first time, we actively promoted the use of electric water heaters and aggressively followed this matter in 1930. Dealers in this territory have not as yet undertaken to enter this field, and all electric water heaters sold in the territory have been sold and installed by the company.

The company has established a Lighting Service Bureau which is now functioning in practically all territory served by the company. This activity will be carried on very actively in 1931.

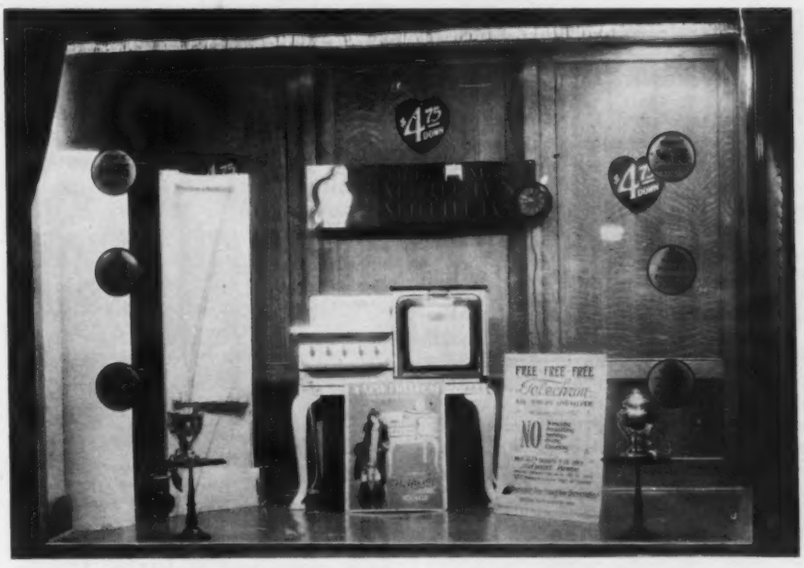
Considerable effort has been devoted to the end of extending service into new territory, particularly in the rural sections, and during 1930 we added in excess of 3,000 new consumers with an estimated annual revenue from domestic consumers alone of approximately $150,000. Estimated annual revenue from other classes of business amounted to approximately $175,000.

We have been very successful in promoting new extensions during the latter part of 1930 and early 1931, thus keeping practically all of our outside crews busy during the winter months and making it unnecessary to lay off any outside men.

The following tabulation shows the annual kilowatt-hour sales for the last five years per domestic consumer:

1926	409 kw.-hr.
1927	447 kw.-hr.
1928	488 kw.-hr.
1929	573 kw.-hr.
1930	720 kw.-hr.

The large increase in kw.-hr. sales per domestic consumer for the year 1930 is practically entirely the result of our increased merchandising activities inaugurated early in 1929, at which time we materially increased our sales organization, with the result that we have offset, at least to a considerable extent, the decreases in industrial power use due to curtailment of mining operations brought about by low metal prices, by materially increasing earnings from domestic and commercial service. We have set as a bogey for 1931 an annual domestic use of 820 kw.-hr. or an increase of 100 per consumer over 1930.



Moscow, Idaho, office window of the Washington Water Power Company

Dealer Sales Get Special Effort

By LEWIS A. LEWIS

Assistant General Manager, The Washington Water Power Company

BRIEFLY, our customer list during the year 1930 has grown from 53,590 to 61,551, an increase of 7,961 divided as follows: Residential, 5,477; commercial, 1,265; industrial, 19; farm, 1,087; miscellaneous, 113.

There was no outstanding merchandising activity during 1930, nor do we anticipate any extensive program of merchandising during 1931, except that a special effort will be made to build up dealer sales. As yet, we have not outlined just what these plans will be, but they will undoubtedly pertain particularly to the major items such as ranges, refrigerators, and heavy-duty cooking equipment. This help will consist of co-operative advertising, assistance in the range installations, and in some cases financial assistance on long term payments, we being firm believers that with the close co-operation of all the dealers in the territory, our domestic and farm load particularly can be built up more rapidly than by carrying this burden alone.

During 1930, a total of 13,323 pieces of current-consuming devices were installed, an increase of 2,288 pieces over the previous year. The outstanding items were 692 ranges, 1,108 water heaters, 1,108 washers, 437 ironers, and 1,017 vacuum cleaners.

We do not sell refrigerators nor radios. We expect to sell 1,600 ranges and about 1,130 water heaters during the next twelve months.

Due to a re-classification of our residence accounts, we do not have a comparison of kilowatt-hours consumed per residence account for the past three years, but for the year 1930, 1,684 kw.-hr. were used per customer with an average annual revenue of $40.21. This is an increase in revenue of $2.77 per customer for the total 47,731 residence accounts. The average revenue per farm customer was $122.27. The kilowatt-hour consumption quoted above includes that consumed in flat-rate water heating.

We have three very active dealers in electric ranges in this territory who are working very closely with us in our campaign. We estimate that these dealers, although their figures are not available, sold between four and five hundred ranges during the year.

Best Year in Company's History

By H. H. COURTRIGHT

President and Manager, Valley Electrical Supply Company, Fresno

FOR THE Valley Electrical Supply Company, merchandising division of the San Joaquin Light & Power Corporation, 1930 has been the most successful year in the history of its organization, notwithstanding the generally depressed economic conditions in our territory, and the consequently reduced buying power of some of our consumers.

Our first concern has been, as ever, the sale of appliances which furnish additional and desirable load to the lines of the parent company, not forgetting that we are organized as a merchandising concern which is expected to maintain accepted merchandising standards.

Following are both the budgets and the actual sales of all classes of electrical appliances for the past year:

HEAVY-DUTY APPLIANCES

1930 Budget		1930 Sales
1,575	Ranges	1,543
1,040	Water heaters	974
475	Air heaters, large	1,091
250	Miscellaneous	337
3,340	Total appliances	3,945
18,150 kw.	Connected load	20,480 kw.

The increase of kilowatt sales over the budget was thus 2,330, or 12.84 per cent. It is estimated that the power company will receive through this load increase an additional yearly revenue of $256,000.

As in former years, this report does not include commercial and industrial

air-heating equipment, sterilizers, and large commercial bake ovens. The promotion of this load is handled by specialists of the power company's new business department.

With the exception of equipment sold by our own stores in Fresno and in Bakersfield, all of the above named heavy-duty appliances were sold by our co-operating dealers, with the assistance of our own field force. In this way, we continued to uphold our established "through the dealer" sales policy.

During the past year we conducted a number of special sales in order to stimulate the demand so as to straighten out the often unfavorable seasonal sales curve. These campaigns were held as follows:

In January, a special employee-user campaign, during which we made it possible for all home owners in the employ of the San Joaquin Light & Power Corporation and subsidiary companies to equip their homes as completely as possible with labor-saving electrical devices.

In the spring and fall, and again at Christmas time, range-water heater campaigns during which we offered, in collaboration with manufacturers and jobbers, standard equipment at especially attractive prices and terms.

During September, October, November, and December we held an unusually successful air-heating sale.

Light-Duty Appliances

Sales of small, or light-duty appliances, including refrigerators, totaled 9,500 pieces. Nearly all of these, except refrigerators, were sold through our own two stores in Fresno and in Bakersfield, since the lessened demand for small appliances in this territory did not make it possible for us to contact our various co-operating dealers as we have done in previous years.

Kilowatt load resulting from the sale of these light-duty appliances may be set at 3,700 kw., and the yearly additional revenue resulting therefrom at $37,000.

Refrigerators

We have sold, both through our stores and through dealers, 2,061 electric refrigerators. This was an increase of 394 units, or 24 per cent over the sales made during 1929.

Increased demand for this appliance in the face of the depressed economic conditions of the valley show very plainly the results of our constant advertising and sales promotion work.

During the past year an estimated average of $60 of electrical merchandise was sold to every domestic current consumer. This is a very high average and is the result of the close co-operation which we receive from all dealers in electrical goods throughout our territory. We are very proud of this co-operation and shall endeavor to maintain this mutual feeling of good will during the coming year of 1931.

For the year 1931, the following appliance sales budgets have been set up:

Heavy-Duty Appliances

1,700	ranges
969	water heaters
1,200	air heaters, large
250	miscellaneous

Total 4,119 heavy-duty appliances.

With a connection value of 20,845 kw., this is a slight increase (365 kw.) over the sales made during 1930.

Light-Duty Appliances

A budgeted total of 16,558 light-duty appliances, including radios and refrigerators, will total an approximate connected load of 7,254 kw.

Refrigerators

Our quota is 2,848 electric refrigerators, including both domestic and commercial types, which is a sales increase of 787 units, or 38 per cent over 1930 sales.

To sell directly, through our own stores, better than $1,200,000 worth of electrical merchandise and to so assist the independent dealers that they will make a success of their own business, while selling many million dollars' worth more, is our 1931 sales program.

Our own organization will give work to nearly 100 employees. Our 132 co-operating dealers, at an average of five employees each, will employ 660 men and women, a total of 760.

We shall continue to sell "through the dealer" as we have done in the past. In this we express our willingness to "live and let live," thereby earning and retaining for ourselves as well as for the power company the good will and consideration of all our consumers, without exception. We desire, by example, to pave the way in a business that will attract the attention of all progressive dealers to a definite aim, that of a complete acceptance, on the part of the public, of electrical labor-saving and comfort giving devices, thereby giving to our power company a better opportunity for service.

Only $3,000 Short Of Budget

By J. A. Clay

General Manager, The Western Colorado Power Company

DUE TO changes in classification of service, commencing with February, 1930, it will be impossible to make any direct comparisons with figures reported for previous years.

As a whole our territory and our business held up well during 1930 until about the first of November. At that time two of our large industrial consumers were forced to curtail or suspend operations temporarily due to low metal prices. This has caused an unemployment situation in the south end of our system which will undoubtedly affect other branches of our business as well as the loss in mining load. However, the new year already indicates an upward trend in the East and we are hopeful that our own section will not be far behind the rest of the country in the return to prosperity.

Merchandise activities during the year 1930 were pleasing. Our actual gross sales for the year fell short of bogey estimate by only $3,000. Several campaigns on large and small appliances were conducted and generally these were successful. Our annual washer campaign, in February, accounted for the sale of 98 machines, 48 over our bogey estimate.

During the year the following major appliances were sold by this company:

Thirty-eight ranges, 218 irons, 17 ironing machines, 81 toasters, 69 room heaters, 56 refrigerators, 33 vacuum cleaners, and 149 washing machines.

Quotas for the major items of appliance sales have not yet been assigned for 1931 but our estimate of gross sales for this year is slightly less than for 1930. We are setting forth below a statement of consumers and connected load on our lines at the end of December, 1930, as reflected by our reports under the new classification:

Class of Service	Number of Consumers	Connected Load in Kw.	Kw.-hr. Consumption per Consumer
Residential	3,415	9,202	73.4
Commercial	1,002	3,134	207.9
Industrial	64	6,281	15,200.0
Farm	669	817	36.5
Municipal street lighting	10	120	3,725.0
Governmental and municipal, miscl.	71	180	188.8
Other electric corporations	3	296	29,796.0
Totals	5,234	20,029	305.0

In addition to the above we are making a comparison of number of consumers on our lines at the end of February, 1930, and at the end of December, 1930. As our new classification was first used in February this is as far back as we can go with such a direct comparison.

Number of Consumers

Class of Service	Dec., 1930	Feb., 1930	Increase	Per Cent Increase
Residential	3,313	3,415	102	3.07
Commercial	975	1,002	27	2.76
Industrial	64	64	.....	.....
Farm	607	669	62	10.21
Municipal street lighting	10	10	.....	.....
Governmental and Munic., miscl.	57	71*	14	24.55
Other electric corporations	3	3	.....	.....
	5,029	5,234*	205	4.07

* Adjustment.

Our territory has been known as a metal mining center, but we are gradually extending our lines into agricultural areas and the possibilities of this field are now being developed which promise to make metal mining a secondary industry with us. We look forward to this development to level the sharp fluctuations in earnings and load that go with the mining industry.

Construction

What of The Leagues?

Wiring Is Stimulated, Adequacy Sold to Builders and Owners, Lighting Improved, and All Branches of the Industry Benefited by These Co-operative, Business-developing Leagues. A Brief Review of How They Made Last Year's Hard Times Less Hard and How They Plan to Carry On During 1931

AMONG those who know their psychology, there may be no mystery as to why a third and disinterested party ofttimes can convince when those who know most about a thing fail. But whatever the reason, the electrical industry cares only that it works; that it does this is attested by the fact that in four different parts of the West a neutral, third party, known either as an Electrical League or as a Bureau, has just completed with flying colors the most crucial test of its career.

Veteran leagues in Colorado, British Columbia, and Utah survived the business depression in an excellent manner. Each finished the year showing substantial increases in wiring and lighting, and a better standing with architects, builders, and home owners. Even the California Electrical Bureau, in spite of a reorganization program which for the year eliminated its field staff completely, carried on very well on the impetus of past years' work. Rechristened "Pacific Coast Electrical Bureau," logically reorganized to become an operating arm of the other industry groups, it promises to become doubly effective.

On this and succeeding pages a separate report is made by each of the four large promotional leagues. With building construction during 1930 at its lowest ebb in ten years, these records of achievement prove that the third party can and does convince the builder where contractors or central stations would be considered too biased. Their achievement also proves that the public appreciates sane, balanced guidance on its electrical installation needs.

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B. C. League Surveys Prove Its Worth

DURING the years 1929 and 1930 the Electrical Service League of British Columbia has made steady progress under the direction of J. Hart, secretary-manager. In reviewing the work of this league, it must be remembered that the organization works on the most modest of budgets, this last year's being under $7,000. Despite this, the league obtained highly satisfactory results, and due to its efforts there are now 2,905 Red Seal homes in Vancouver and district, while educational work of enormous potential value to the industry has been done.

In connection with these efforts during last year the league sent out about 8,000 circulars in a series of three. These were sent to every permit taker in Vancouver, Burnaby, North Vancouver, and West Vancouver. The builders, general contractors, architects, electrical contractors, and members of the Property Owners Association, and the Real Estate Exchange were also covered. In addition to these circulars, five different booklets, wiring plans, blotters, etc., were sent out, so that in all some 20,000 pieces of literature were distributed by the league during the year.

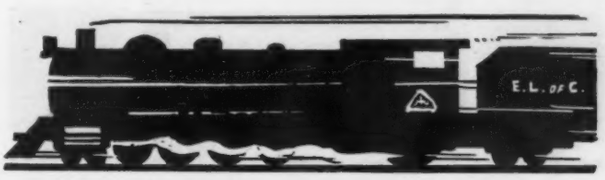
This, with four other booklets, was distributed by the B. C. League in 1930

Novel borders used on literature of the Colorado League

The league devoted considerable time and effort to commercial lighting, industrial lighting, school lighting, and even street lighting, according to its last annual report, and in all cases secured results of great value to the electrical industry.

The major operation of the league in the past four years has been to promote better wiring in the home. The success of this has been gratifying as the specifications adopted by the league are considerably higher than those used by the majority of leagues carrying on Red Seal work.

Building records for Vancouver during the years 1929 and 1930 show a decrease of approximately 10 per cent over each previous year, together with a decrease in value. These figures apply only to private residences, as the total building records showed a slight gain.



To ascertain to what extent a Red Seal home would install electrical appliances, the league made a survey of the appliances installed in homes of five rooms, six rooms, seven rooms, eight rooms, and over. Twenty-five homes of each size were picked at random from the Red Seal files. The league's field man was successful in obtaining statistics on appliances in 73 of these homes. The following table is self-explanatory:

One of the 1,926 Red Seal California homes of 1930; wired by Linder Service Shop of Marysville

Appliance Survey of 73 Houses of 5, 6, 7, and 8 Rooms and Over.

Ranges	67	Warming pads	12
Water heaters	60	Radios (electric)	58
Washing machines	48	Mixers	0
Electric refrigerators	19	Hot plates	5
Electric fires	20	Electric grills	4
Electric heaters	18	Floor polishers	34
Ironers	15	Dish washing machines	0
Health lamps	1	Electric clocks	5
Vibrators	2	Immersion heaters	9
Exercisers	2	Electric fans	14
Sewing machines	22	Oil furnaces	22
Vacuum cleaners	62	Floor lamps	220
Irons	89	Table lamps	260
Toasters	68	Electric egg beaters	1
Percolators	53	Electric trains	1
Curling irons	52	Waffle irons	15

Estimated value of the above appliances is $53,005, an average of $726 per home for electrical appliances.

On Nov. 30 in Greater Vancouver there were 1,748 Red Seal homes, 42 duplex residences, and 1,115 suites in 69 apartment blocks, or a total of 2,905 Red Seal homes.

In addition to the figures and facts revealed in the annual report, the Electrical Service League, under R. Hall, who temporarily relieved Mr. Hart of the duties of manager, conducted a further survey during January and February of last year.

This two-month survey showed that in this period the league had sent out 584 circular letters with suitable literature. During the same period the league's fieldman made 458 calls, and was successful in getting 48 houses fitted with Red Seal wiring. The fieldman was also successful in adding from two to six outlets in 24 residences.

In order to convey the importance of the league, a further survey was made of twenty houses of five rooms each picked at random from the files:

Wiring survey. Ten five-room houses, not Red Seal.

Ceiling outlets	126
Brackets	39
Convenience outlets	86
Switches	115
Special outlets	4
	370

Average cost, including labor, to wire residence is $74.

Wiring survey. Ten five-room houses, Red Seal.

Ceiling outlets	190
Brackets	118
Convenience outlets	123
Switches	170
Special outlets	6
	607

Range and water heater not included in this table.

Average cost to wire, including labor, range and water heater, is $165 per residence.

It is very apparent from this survey that the electrical industry as a whole is the loser from the residences not wired to meet Red Seal standards.

The amount of material required to wire these houses is based on the number of outlets installed, and the league has secured the following data on this subject:

Material costs to wire one five-room Red Seal house with an average of 60 outlets, including range and water heater	$100.40
Material costs to wire one five-room non-Red Seal house with an average of 37 outlets	42.18
Difference in cost of materials purchased from manufacturer or jobber, per house	$ 58.22

This is based on an average cost for material of $1.14 per outlet, and $32 for range and water heater wiring.

These figures are supplied to the league by a reliable Vancouver contractor who specializes in residential wiring.

The difference to the central station in energy consumed is as follows:

	Kw.-hr.
Ten five-room Red Seal houses in October, November, December used	5,865
Ten five-room non-Red Seal houses in October, November, December used	1,433
A difference in three months of	4,432

In further commenting on this two-month survey Mr. Hall states that the speculative builder gives the most opposition. His chief objection is cost. While the league has been very successful in increasing the average number of outlets in the residences erected for speculation, there is great difficulty experienced in having complete range wiring installed during construction. However, few residences are now erected in the Point Grey area that do not have the conduit for range wiring installed, but that is as far as the speculative builders will go. Mr. Hall attributes this opposition to the following causes:

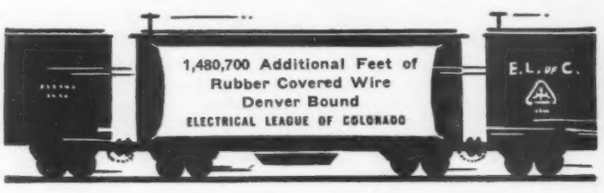
1. Wiring costs.
2. Lack of knowledge regarding wiring required for present-day needs.
3. Lack of aggressiveness on the part of the electrical contractor.
4. Insufficient publicity on electrical convenience and economy.

Field Results 42 Per Cent Above 1929

By GEORGE BAKEWELL, JR.
Manager, Electrical League of Colorado

DURING the past two years the work of the Electrical League of Colorado has been considerably less spectacular than in former years. This is in accordance with the wishes of the board of directors, which believes that little is to be gained by financing flash-in-the-pan activities of questionable economic value, although they may have considerable news value and may please a minority of our members. We feel that our job is to sell adequate wiring installations in all types of structures. By encouraging the public to wire for the future we feel that we are serving every branch of the industry, and the public as well.

During 1930 our field staff (a one-man department) averaged approximately ten calls a day on architects, builders, owners, and others interested in building construction. As a result of these 3,024 contacts he succeeded in having a total of 4,834 additional outlets installed in buildings completed during the year, and arranged for the installation of 8,433 additional outlets in buildings now under construction or to be erected early in 1931. In face of the fact that the value of Denver building permits for this past year represented an $8,626,500 decrease when compared with 1929, the effectiveness of this field service effort was 42 per cent better than in 1929 and 94 per cent better than in 1928. During the eight years that a field representative has been employed, we have succeeded in encouraging the installation of 34,448 electrical outlets in addition to those originally planned by the architects and builders. It is conservatively estimated that the increase in connected



wiring capacity brought about by these added outlets amounts to more than 4,800 kw. In 1930 alone the increase in connected wiring capacity of the outlets installed as additions to completed buildings amounted to 451½ kw.

Last year we extended our Red Seal program so as to include ten more Colorado communities. This year we hope to do even better, and likewise to launch the Franklin Red Seal specification activity. Red Seal applications signed during 1930 total 217. There were 228 Red Seal certificates issued, and 131 applications are now pending. Thirteen per cent of the houses completed in 1930 were wired to Red Seal specifications. There were 13 apartment houses built, nine of which had a total of 176 individual suites and were wired to Red Seal specifications. This represents more than 73 per cent of the total.

We adopted a constitution and by-laws and incorporated the league during the past year; initiated a movement to encourage the adoption of uniform range wiring standards for Colorado, Wyoming, and New Mexico; conducted an electrical-gifts-for-brides campaign; gave lighting demonstrations and talks before various commercial bodies and women's organizations; sponsored a state-wide meeting of electrical men; conducted a Christmas merchandising campaign; and have just completed the most successful Christmas outdoor lighting activity in our history.

There seems to be no justification for us to alter this program in 1931 in so far as the fundamental activities are concerned. We will, of course, tie in on the N.E.L.A.'s refrigerator drive, and will continue to serve the other national associations to the best of our ability in whatever activities they may launch during the new year. Our budget is to start on the same basis as for 1930. Within the year, however, we hope to set up what we may term an "expansion program budget" in order that we may advertise our services to the public more effectively.

BUDGET

The annual budget is to be $13,500. Expenditures anticipated for the ensuing year are as follows:

Salaries	$ 8,000
Rent	720
Travel	700
Postage	100
Telephone and telegraph	150
Stationery and supplies	125
Printing and mimeographing	250
Bulletin	450
Office maintenance and equipment	50
Advertising and publicity	2,500
Miscellaneous	455
Total	$13,500

SOURCES OF REVENUE

Operating revenue has been apportioned as follows:

Manufacturers	25%	$ 3,375
Wholesalers	18%	2,430
Contractor-dealers	7%	945
Public utilities	50%	6,750
	100%	$13,500

Nothing but optimism is expressed regarding building construction prospects for the new year. Several major commercial and industrial projects are now under way and we look to a revival of building in the residential field to make up for the decline in 1930. Denver electrical contractors are banded together perhaps more securely than they have been during the past decade; recently they completed the formation of Denver Chapter No. 1 of the Association of Electragists, International. Exceptionally well attended meetings are being held weekly and plans are now in effect that tend to stabilize competitive bidding.

Utah League Holds Lighting School

By R. E. FOLLAND

Executive Secretary, Electrical League of Utah

SUBSTANTIAL progress, in view of the decrease in building, has been made in Red Seal applications, and a decided progress in our commercial field. Some new work and considerable remodeling during the past year gave our lighting service bureau an opportunity to increase materially the electrical layouts.

During the early part of 1930 we held a lighting school, which was conducted by S. G. Hibben of the Westinghouse Lamp Company. This school was a success from every angle.

Our ordinance committee acted as a sifting committee in being instrumental in preventing the passage of proposed ordinance changes that did not have the support of the industry.

This year's Christmas lighting program was again sponsored by the Salt Lake City Chamber of Commerce and received the hearty support of the residents of the city. Although we did not have the same number of large, elaborate displays that were evidenced last year, we did have a greater number of modest and small decorations. This, of course, is the original intention of our efforts. The business houses decorated to a greater extent than in any previous year.

Our 1931 program and budget has not yet been definitely approved. It is expected, however, that we will continue as during 1930.

We expect a normal year in building construction for 1931. Vacancy surveys show that we are not overbuilt in any type of construction. Two federal projects are under way, which will increase the volume in that particular field. Last year we had an abnormal year in the apartment house field, and do not expect to equal it in 1931. In private homes, however, we expect to exceed last year's record. As far as the building of business property is concerned, we are unable to make any very close estimates.

We have an active chapter of the Association of Electragists, International, which is accomplishing good work in the contracting field. With the aforementioned prospects for 1931 in building, the contracting division of our league should have a considerably better year, and consequently create an even better spirit of co-operation and good will.

California Group Plans for the Future

By VICTOR W. HARTLEY

Assistant Managing Director, Pacific Coast Electrical Bureau

THE 1930 history of the California Electrical Bureau is largely one of planning and building for the future. It had been decided during 1929 that there was need for a complete reorganization of all the promotional activities and an affiliation that would tie them together with a more unified purpose. Consequently, the bureau entered 1930 reduced, both financially and in man power, to the bare necessities incidental to the continuation of the Red Seal plan.

H. Rosenbloom's home at Chico, Calif., Red Seal wired by Breedlove Electric Company

Without a field staff, it was extremely difficult to combat a declining building program and produce Red Seal jobs, but the intense interest taken in this activity by the Southern California Edison Company Ltd. resulted in accomplishments in its territory greater even than those of the year previous; and over the state as a whole 1,926 new applications were obtained.

By fall the reorganization plans had been perfected in theory and during the past four or five months the scheme of organization has been gradually applied to the actual operative program. The Jan. 1 issue of ELECTRICAL WEST reproduced the organization chart and a detailed description of a new plan of operation. State committees on such pertinent industry subjects as lighting, appliance merchandising, industrial electrification, agricultural electrification, and co-operative advertising have been formed and will develop promotional programs in those fields comparable to the Red Seal program which has done so much in recent years to improve the wiring situation.

Not alone will these committees devise new programs for their respective activities, but they will offer a natural outlet for the promotion of the programs developed within the committees of the Commercial Section of the Pacific Coast Electrical Association, thus materially strengthening that organization's committees through the knowledge that any constructive programs which they may develop are assured of being placed in actual operation.

News

Oregon Governor's Message Significant on Power

A change in the set-up and duties of the Oregon Public Service Commission, revision of the state's water power laws, and enactment of power district legislation were among the more important recommendations contained in the message to the incoming Legislature by Julius L. Meier, newly-elected governor.

Abolition of the regulatory body "as now constituted" and the substitution therefor of a single commissioner appointed by the governor, vested with all the powers of the present commission with added responsibility of supervision over the issuance of securities, and with the "specific duty of representing the public in all controversies with utilities," was the principal feature of his treatment of regulation. Also he advocated the application of the home rule principle to municipalities so that cities would be permitted to contract with utilities by franchise "as to rates, service, and facilities within their respective boundaries." In addition, he urged the repeal of that portion of the utility law providing for the certificate of convenience and necessity.

On the subject of water power his recommendation would bring the state law into similarity with the federal law. A commission of three would be created to study the water power resources of the state; to issue preliminary permits for investigation of projects; and to issue limited term licenses for construction and operation under limitations as to the amount of return permitted on the investment. Preference would be given to applications of municipalities, but the governor advised the assembly that it is not his policy to exempt such development from taxation. Privately-owned utilities operating in the state, therefore, may expect to receive at least a modicum of relief from what would otherwise be impossible competition at the hands of public-owned utilities brought into existence and operated under the recently adopted constitutional amendment providing for water and power district organizations.

A brief reference to the district power amendment bespoke the Legislature's consideration of the act now under preparation by the State Grange designed to make the amendment operative.

The governor expressed unqualified approval of the bill before the national congress authorizing the Umatilla Rapids development on the Columbia River, and urged the Oregon Legislature to "memorialize Congress for its immediate construction." A large portion of his peroration was devoted to pointing out the significance of water power as a natural resource, and he closed with a plea "for the preservation of this rich natural heritage and its development for the benefit of the State of Oregon and its people."

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Los Angeles Water and Power Bureaus Merged

Consolidation of the Los Angeles municipal water and power bureaus as one Department of Water and Power was effected Jan. 13 by the board of water and power commissioners. H. A. Van Norman, formerly chief engineer and general manager of the Bureau of Water Works and Supply, was appointed chief engineer and general manager of the consolidated bureaus. E. F. Scattergood, formerly chief engineer and general manager of the separate Bureau of Power and Light, was made chief electrical engineer of the newly organized department.

H. A. VAN NORMAN
Heads both water and power

At the same time dismissal was ordered of four employees of the power and light bureau on charges that they were guilty of the removal and destruction of public records during the water bonds campaign in May, 1930. The four are Burdett Moody, business agent of the Bureau of Power and Light; C. O. West, executive assistant in the engineering department of the bureau; James F. Moran, a construction foreman; and T. H. Mullen, head of the bureau's transportation division.

The sweeping reorganization of the bureau was made for the purpose of increasing efficiency and economy, according to the resolution adopted by the board. The change restores Mr. Van Norman to the position he held for about nine months a year ago while the bureaus were operated as one organization, and virtually reverses the positions of Mr. Van Norman and Mr. Scattergood in that during recent years Mr. Scattergood was, in effect, general manager of the department because he had under his jurisdiction the divisions which served both bureaus. This latter jurisdiction was transferred to Mr. Van Norman on Nov. 25, 1930.

Concerning the ordered dismissal of the four employees, the resolution of the board recited that valuable documents useful in the operation of the Department of Water and Power "were removed under the cover of night from said executive offices and destroyed," and that the commission had held hearings on the matter and found that "preponderance of evidence shows that the removal and destruction of said public records were the willful, deliberate, negligent and destructive acts and attitudes of certain employees of the Department of Water and Power." Another resolution directed that a copy of the transcript of the hearings be turned over to the city prosecutor for such action as he may see fit to take.

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P. G. and E. Asks Dismissal Of Modesto Rate Protests

In a petition filed with the California Railroad Commission Jan. 17, the Pacific Gas and Electric Company asked the dismissal of the complaints by the Modesto Irrigation District, the City of Oakland and the City of Stockton against the power company on account of the lowered rates put into effect by it in Modesto, Calif. The complaints had asked that rates over the entire P. G. and E. system be placed on a par with those in Modesto. Dismissal of the complaints was asked on the grounds that they were insufficient to constitute a cause of action, and that the Railroad Commission has no legal jurisdiction to hear the complaint because it has no authority over municipally owned utilities.

P. G. and E. contends that its rates were lowered in Modesto to meet rates established by the Modesto Irrigation District in the latter's "aggressive and unfair campaign of competition for electric consumers in Stanislaus County and to forestall the district from further taking defendant's customers;" that the company will suffer a loss in revenue of hundreds of thousands of dollars if the Modesto rates should be established throughout its entire system; and that the remainder of the system is under no additional burden to compensate the company for the reduced rates in Modesto. The case is being heard as this issue of ELECTRICAL WEST goes to press.

El Camino, Carmichael, and East Contra Costa Irrigation Districts, and the City of Fresno added their complaints against P. G. and E. last month to those already on file with the Railroad Commission.

Injunction Halts Lowering Of Los Angeles Gas Rates

In granting to the Los Angeles Gas and Electric Corporation an interlocutory injunction against the California Railroad Commission and various state and city officials, prohibiting enforcement of a recent commission order to reduce company gas rates, three federal judges on Jan. 2 upheld a previous temporary restraining order issued in December by Judge W. P. James.

Judge Wilbur, presiding over the statutory court which granted the injunction, said:

"In view of the gravity of the question raised, the judges constituting this court will grant the interlocutory injunction pending a final decision. A decision granting a permanent injunction, if one were issued, would only mean that this new rate would not be collected. The court would leave to a regulatory body the question of the rates to be charged."

Contending that the reduced rates would cut $1,300,000 per year from earnings, allowing less than 5 per cent per annum profit on the company's property instead of a necessary 8 per cent on the cost of reproduction or replacement of the property, the utility charged that the order is confiscatory and unconstitutional.

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Power Commission Firmly Seated; King Reinstated

Dr. George Otis Smith, U. S. Geological Survey director, as chairman; Frank McNinch, Marcel Garsaud, Claude Draper, and Ralph Williamson as commissioners, were the names President Hoover sent to Congress late in December for confirmation as the new Federal Power Commission. All were confirmed, and three were sworn in before Christmas.

One day later F. E. Bonner, W. B. King, and C. A. Russell, respectively executive secretary, accountant, and solicitor for the old commission, were told by Commissioners Smith, Garsaud, and Draper that they need not apply for reappointment—tantamount to dismissal. Senators howled, chiefly Brookhart, of Iowa, and demanded a reconsideration of the confirmation of the commissioners, contending that the retention of Messrs. Russell and King was necessary to the protection of the public's interest. The President demurred and then refused, as a question of precedent and executive rights was involved. Countering, the Senate threatened to hold salary appropriations for the commission, ousting them by starvation methods.

Latest developments appear to show the commission firmly in office as the pay checks arrived on time. While rumblings following the passage of the storm still continue, chiefly charges of "power trust" affiliations against Commissioners Smith, Garsaud, and Draper, it is apparent that the President has won.

All commissioners recently voted to restore Mr. King to the staff, though with less responsibility. Mr. Bonner explained that he was about to resign and has now entered civil engineering practice. Col. Max Tyler, chief engineer for the old commission, will continue in that capacity.

While frankly expressing his conviction that private operation of water power projects is greatly to be desired over public operation, Dr. Smith makes it clear that he realizes it is the intent of the water power act to give preference to states and municipalities that may apply for rights, and that he would vote for the public project when it is in a position to make comparable use of a resource.

In general, Dr. Smith favors state regulation, he says, but in cases where regulation is not accomplished by the state, "the federal government will have to fill the gap." Where interstate transmission is involved, regulation can be accomplished successfully with full recognition of both state and federal authority, he believes.

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Seattle Council Bars Vote On Engineering Authority

Seattle's city council has refused, 6 to 2, to submit to popular vote, on March 10, an amendment giving the City Light Department jurisdiction over its own engineering work, relieving the city's engineering department of that task.

Referendum petitions forcing a popular vote are being circulated, City Light charging that lack of co-ordination between the two offices resulted in a $1,000,000 loss when the Diablo power house, on the Skagit River development, was not completed by the time the dam was ready for use. On this score, the Citizens' Municipal Utilities Protective League, petition circulator, declares the engineering department is "either patently inefficient or deliberately obstructing the light department's development work."

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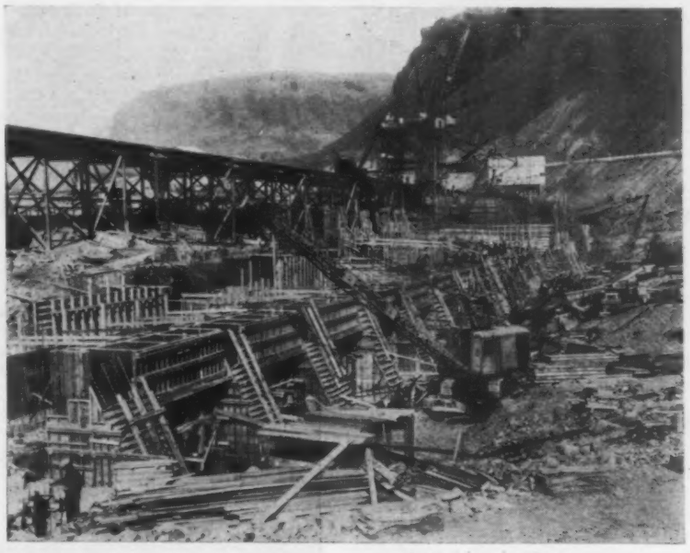
Rock Island Site Scene of Much Activity



EARLY stages of power house construction may be seen in this view looking along the downstream face of the Rock Island dam now being built across the east channel of the Columbia River by Stone & Webster Engineering Corporation for the Washington Electric Company, a subsidiary of the Puget Sound Power & Light Company. Concrete for the upper levels of the power house is being poured by the gantry crane operating at the farther end of the trestle.

Power from this development by Nov. 1, 1931, is the plan of the Washington Electric Company, according to Leslie R. Coffin, manager. Two of the 15,000-kw. units are expected to be put into service by that time, and two more are to be operating by Aug. 1, 1932. Current will be brought over the Cascades and will tie into the western system of the Puget Sound Power & Light Company at Skykomish.

Work on the dam is more than nine months ahead of schedule, and every effort is being made to retain that lead. With the beginning of the new year the 880-ft. power house now under construction and the spillway adjoining it in the east channel of the river attained a height beyond the water level. This will permit removal of the cofferdams and their reconstruction in the west channel of the river early this spring, Mr. Coffin said, which will allow the permanent dam in the west channel to be built next fall and winter.

Portland Council Favors Municipal Power System

By a vote of three to two the city council of Portland last month placed itself on record as being "in favor of a municipally owned and operated power and light system in the city" and took the first step toward authorizing its commissioner of public utilities to spend any or all of the $25,000 budgeted by the city for investigation of the feasibility of developing a municipal light and power system.

This action was embodied in a resolution introduced before the council by newly-elected Commissioner Ralph Clyde, who since taking office has been made commissioner of public utilities. Dissenting votes were cast by Mayor George L. Baker and Commissioner S. S. Pier, both contending that action by the city should be deferred until the State Legislature, now in session, should lay down a program of power development in accordance with expectations, and contending that the council had before it insufficient data on which to base action on a resolution of this kind.

The $25,000 referred to is the amount placed in the city's budget at the behest of Commissioner Clyde and allowed by the Tax Conservation Commission. A like amount was placed in last year's budget, but disallowed by the commission. Before the investigation can proceed, however, it will be necessary for the council to pass an appropriation ordinance.

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Gerard Swope Optimistic About 1931 Business

Bringing a message of encouragement to the electrical industry, Gerard Swope, president of the General Electric Company, arrived in San Francisco Jan. 17 on a combined business and pleasure trip during which he inspected the properties of the company in the Bay region. The trip from New York was made aboard the Panama-Pacific liner *California*, one of the three luxurious passenger ships electrified by his company.

Commenting on the $341,820,312 of orders received by the General Electric Company during 1930, Mr. Swope pointed out that this amount is only 2 per cent below the value of orders received during 1928, although it is approximately 23 per cent below the 1929 figure. The decline during 1930 is partially due to a transfer of the radio set and tube business, the sales of which are not included in the figures for that year.

Mr. Swope stated that, in his opinion, the electrical industry had been less affected than many others by the current depression. While there was a decrease in the use of electrical energy in 1930 by the commercial users, a gratifying increase in the consumption of domestic power was recorded, with the result that the total production of electric power was but slightly decreased. With the continued development of industrial processes using electric power as a basis, and with the increasing demand for all types of domestic appliances, Mr. Swope believes that the utilities have every reason to expect that energy consumption during the current year should equal, if not exceed that of 1930.

The General Electric Company, under the guidance of Mr. Swope, has been a pioneer among other large corporations in the effort to stabilize production through the use of carefully planned schedules which eliminate, to a large extent, unemployment resulting from seasonal variation in demand for the company's products. Furthermore, this company was the first to install a system whereby an employee, temporarily laid off as a result of reduction in orders, is paid a definitely established weekly rate during unemployment from a fund which is built up by the company and the worker during his employment. These two sources of contributions are supplemented by very small deductions from the pay of other workers during the time that payments are being made from the general fund. Far-sighted administrative policies, inaugurated by Mr. Swope and his associates for the benefit of employees, have been instituted to insure a definite income to the employee, and thus assist in the stabilization of business.

50,000-Hp. Development For Davis River (Alaska)

Plans given out by Willis T. Bacheller for the first part of the development by the Portland Canal Power Company on the Davis River in Alaska contemplate the erection of a 350-ft. dam and installation of two 7,500-hp. reaction turbines. Eventually the dam will be raised to a height of 600 ft., and two more units will be installed, giving the plant an ultimate capacity of 50,000 hp. The dam site, approximately 2,100 ft. back in the Davis River canyon from the power house site, is in a granite gorge 20 ft. wide at the bottom and 100 ft. wide at the top. Present reaction turbines are designed to operate at 350-ft. and 600-ft. heads respectively, with approximately the same efficiency. Reservoir capacity will permit control of the river to a flow of 700 sec.ft.

The power house will be built at tide water. Water from the reservoir will be conveyed through a 16-ft. concrete-lined tunnel for 1,600 ft., and through a steel penstock for 500 ft. additional, there branching into two 6-ft. intakes.

Because of the ruggedness of the country, it will be necessary to run transmission lines up the canyon, the main transmission line being 14 miles long.

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Salt Springs Dam's Rock Fill Section Widens

DERRICK placed rock operations on the up-stream face of the Salt Springs Dam, being built by the Pacific Gas and Electric Company as a part of its Mokelumne River project, had progressed, on Dec. 17 last, to the stage of construction shown above. Concrete is transported across the face of the dam by means of the trestle and track shown midway in the rock-fill section. Shaded sections near the center of the picture show where reinforcing is in place; sliding forms used for concreting the face of the dam are also visible. The power house is already under construction on the downstream side.

Light Adds Beauty to Chapel

OUT in the country, and at night an island of light in contrast to the great area of darkness about it, the floodlighted St. Vincent's Chapel of St. Vincent's boys' school, north or San Rafael, Calif., makes a striking landmark. The exterior lighting consists of eight 1,000-watt floodlights, arranged in groups of four each on two poles 300 ft. away from the building. In the belfry two more floodlights with color lenses outline the arches in pastel shades.

In front of the church are clusters of white lights on standards 10 ft. high which illuminate the immediate foreground. Over the entrance-way is a large art-glass window, lighted both on the inside and on the outside so that its beautiful coloring may be appreciated from either the interior or exterior of the building.

Other lighting features of the chapel consist of diffusing globes, fixtures, and concealed reflectors in the main auditorium, and indirect lighting from behind shelves on the side walls. An intensity of 3.5 foot-candles is obtained in the main auditorium. The chancel and altar are brilliantly lighted to an intensity of 20 foot-candles by means of concealed spots and floodlights placed in the arch above the altar.

Garden lighting consists of spot lights on groups of statuary in and about the garden. A total of 44-kw. in lighting is installed. The installation was made by Balboa Electric Company, of San Francisco, and engineered by Gilbert Trosper, lighting salesman for the Pacific Gas and Electric Company, North Bay Division.

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GLENDALE, ARIZ., SELLS SYSTEM TO POWER COMPANY—By a vote of 601 to 128, the town of Glendale, Ariz., has accepted the offer of the Central Arizona Light & Power Company, Phoenix, to take over the municipal electric system for a cash price of $287,500 and furnish electric service to Glendale.

N.E.L.A. 1931 Prize Award Terms Are Announced

Prize awards to be administered by the National Electric Light Association in 1931 include awards to individuals for papers on subjects relating to the electric light and power industry and awards to companies and individuals for accomplishments in specified activities.

For papers the awards offered are the same as those given last year. They are as follows:

Henry L. Doherty Prize, General: A gold medal donated by Henry L. Doherty, president, Henry L. Doherty & Company, for the best paper on any subject relating to the electric light and power industry.

H. M. Byllesby Accounting Prizes: Cash awards of $250, $150 and $100, donated by H. M. Byllesby & Company, in memory of Colonel H. M. Byllesby, for the three best papers showing how to increase the usefulness of the accountant in the public utility industry.

Martin J. Insull Public Relations Prize: A cash award of $250 donated by Martin J. Insull, president of the Middle West Utilities Company, for the most meritorious paper dealing with public relations in the electric light and power industry.

James H. McGraw Engineering Prizes: Cash awards of $250, $150, and $100, donated by James H. McGraw, chairman of the board, McGraw-Hill Publishing Company, for the three most meritorious papers on any engineering or technical subject relating to the electric light and power industry.

James E. Davidson Commercial Prizes: Cash awards of $250, $150, and $100, donated by J. E. Davidson, president, Nebraska Power Company, for the three most meritorious papers dealing with commercial or merchandising problems of the electric light and power company.

Contestants should be guided by the following rules in submitting manuscripts:

Any person employed by any company having membership in the N.E.L.A. is eligible to submit papers and enter the competition, with the exception that no person is eligible to win the same prize two years in succession.

Papers must be the original work of the authors, prepared exclusively for this competition. The prize for which a paper is submitted should be indicated.

On the first page of the manuscript the following information should be shown:

Submitted for the 1931.....Award
Title of paper.....
Submitted by (name of author).....
Employed by (name of company).....
Employed as.....
Address (street, city, state).....

Papers may be of any length, and pen and ink drawings or photographs suitable for reproduction may be included.

This year for the first time the prize awards committee of the N.E.L.A. will administer the James M. Gilchrist Award, formerly known as the Federal Electric Award, as well as the Forbes Prize. In addition, a new prize is announced this year for the first time,—the Augustus D. Curtis Award.

James M. Gilchrist Award: A gold medal donated by James M. Gilchrist, vice-president, Federal Electric Company, to the electric light and power company member of the N.E.L.A. making the greatest contribution to the advancement of electrical advertising during the twelve months ending March 1, 1931, and a cash award of $1,000 to the individual in that company responsible for the achievement.

Such a contribution may be: (*a*) A new use for electrical advertising; (*b*) an identification program, such as has been inaugurated by certain holding companies; (*c*) in form of an enterprise whereby businesses throughout the country, or in a particular community, are brought to a keener realization of the value of electrical advertising; (*d*) in form of an activity which makes possible better merchandising of electrical displays.

Augustus D. Curtis Award: A certificate contributed by Augustus D. Curtis, former president of the Curtis Lighting Company, to the company, and a cash award of $500 in gold to the person responsible for the achievement in the company, that shows the greatest contribution to the electric lighting of commercial and public buildings. This contest includes accomplishments realized up to Dec. 31, 1930. For further details see ELECTRICAL WEST, Sept. 1, 1930, p. 149.)

B. C. Forbes Public Service Cup: A silver cup, contributed by B. C. Forbes, editor of *Forbes Magazine*, to the company which conducted the most constructive public relations campaign during the year 1930. The following data must be submitted by contestants: (*a*) Plan of campaign and how conducted; (*b*) exhibits of all types of advertising and literature used; (*c*) record of achievement as indicated by sales of securities to customers, increased use of appliances, increased sales of light and power; (*d*) data indicating growth of good-will.

All papers and exhibits must be forwarded to the secretary of the N.E.L.A., 420 Lexington Ave., New York, on or before April 1, 1931. Registration blanks for the Gilchrist and Curtis awards may be secured from the commercial department of the N.E.L.A. at the same address. Announcement of prize winners will be made at the N.E.L.A. convention in Atlantic City, N. J., June 8-12, 1931.

The N.E.L.A. prize awards committee consists of Frank W. Smith, United Electric Light & Power Company, New York, chairman; Alex. D. Bailey, Commonwealth Edison Company, Chicago; Franklin Heydecke, Public Service Electric & Gas Company, Newark, N. J.; T. O. Kennedy, The Ohio Public Service Company, Cleveland, Ohio; Harry Reid, National Electric Power Company, New York; Earl Whitehorne, McGraw-Hill Publishing Company, New York; and Miss Clara Ziflessen, Philadelphia Electric Company.

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Sixth Unit of Vancouver Steam Plant in Service

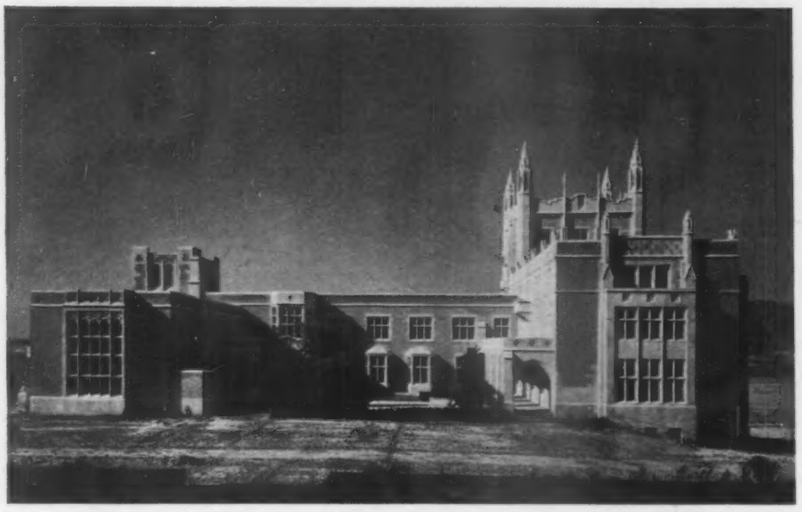
Adding 6,700 hp. to the capacity of the British Columbia Electric Railway Company's steam power plant at Vancouver, the sixth unit has been completed and put into service, the machine having been turned over successfully on Dec. 6.

Costing approximately $181,000, the new equipment forms the largest steam unit in the province of British Columbia, being fed by a boiler of 1,117-hp. rated capacity, and brings the generating capacity of the steam plant up to 23,500 hp.

Located in the heart of the City of Vancouver and adjoining the big distributing center of Main Street substation, the steam plant is held available to deliver energy into the B. C. Electric power system in case of emergency.

During the extraordinary water shortage of 1929, the steam plant provided over 250,000 kw.-hr. daily.

Students' Hall Commemorates Work of W. G. Kerckhoff



A MEMORIAL to the late William G. Kerckhoff, Kerckhoff Hall, this $800,000 University Union building, has been presented by Mrs. Kerckhoff to the University of California at Los Angeles. The building unites all student social activities of the university under one roof.

Governor James Rolph, Jr., of California; Robert G. Sproul, president of the University of California; Ernest Carroll Moore, director of the University of California at Los Angeles; regents of the university, and officers of the Associated Students, participated in dedicatory ceremonies held on Jan. 20.

Mr. Kerckhoff, whose name appears frequently in the records of the development of light and power companies of California, died two years ago at the age of 73 years.

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New Unit Adds 18,000 Hp. To Jordan River Plant

With the completion of the installation of an 18,000-hp. unit, which was officially placed in operation late in November, the generating capacity of the British Columbia Power Corporation's Jordan River power plant has been fully developed and stands at 39,500 hp. This gives the company's present Vancouver Island system a capacity of 49,610 hp. and brings the installed capacity of the combined mainland and island hydro and steam plants to 279,160 hp.

The steel penstock for this fourth and last unit, the largest in the plant, was fabricated and erected by the Vancouver Engineering Works, Ltd., and the waterwheel, generator, and motor generator set were manufactured by the English Electric Company of Canada, Ltd. The Canadian Westinghouse Company, Ltd., supplied the four 5,000-kva. transformers, and the Canadian General Electric Company, Ltd., furnished the switch gear and control panel.

The first two units of the Jordan River power plant, each of 5,500-hp. capacity, were installed in 1912 and the third unit of 10,500-hp. capacity followed in 1914. When the third installation was made, the power house was enlarged to receive the fourth unit. This plant has the highest Ambursen type diversion dam in Canada, it being 126 ft. high from the lowest foundation and 891 ft. along the crest.

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Two Changes in Railroad Commission Personnel

Two changes in personnel of the California Railroad Commission became effective Jan. 1, 1931. M. B. Harris, of Fresno, was appointed by Governor C. C. Young on that date to serve a full term of six years as successor to Thomas S. Louttit, whose term has expired. Mr. Harris resigned as a member of the State Highway Commission to accept the appointment. He served as a member of the State Senate from 1919-1927, and has been active in civic affairs in California for many years. He is an attorney, and had practiced law as a member of the firm of Harris, Willey, Griffith & Harris up to the time of his appointment to the commission, resigning to accept the appointment.

Fred G. Stevenot, who has served as state director of natural resources during the last four years, was appointed by Governor Young to serve the remaining two years of the term for which W. J. Carr originally had been appointed to serve. Mr. Carr resigned in order to accept a full six-year-term appointment to succeed Ezra W. Decoto, whose term has expired.

Clyde L. Seavey has been re-elected president of the commission for 1931. His re-election marks the first time the commission has departed from its custom of rotating the presidency among its members according to length of service.

New Policy to Speed Work of Commission

Long-drawn-out rate or other proceedings are banned in a resolution passed last month declaring the policy of the California Railroad Commission for the future transaction of its business. The resolution follows:

"Resolved, That the following statement of policy be adopted as the policy of the Commission in the transaction of its business:

"Cases and proceedings shall be set for hearing promptly when at issue. In the absence of special circumstances, such as the necessity of engineering or technical investigations, hearings will be commenced within 30 days of the date matters are at issue.

"Continuances and postponements will not be looked upon with favor.

"The Commission will revert to its early policy of having more matters heard by the commissioners themselves.

"In the absence of special circumstances decisions will be gotten out within 30 days of submission. Commissioners and examiners conducting hearings will be expected to prepare and submit orders within this time."

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Company Formed to Bring Gas to Los Angeles

Construction of a $7,000,000 gas pipe-line from the Kettleman Hills (Calif.) oil field to Los Angeles and Long Beach, 225 miles away, will be started about April 1 by the Southern Fuel Company, newly formed organization controlled by Southern California Edison Company Ltd., and Southern California Gas Company. Fuel requirements of the Edison company's Long Beach plant and other domestic and industrial consumers will use the 130,000,000 cu.ft. per day capacity.

Alexander B. MacBeth, gas company head, will be president and general manager of the new company, with F. B. Lewis, Edison vice-president, as vice-president and assistant general manager; F. S. Wade, Southern Counties Gas Company president, and G. C. Ward, executive vice-president of the Edison company, as vice-presidents; and D. M. Trott, Edison vice-president, as secretary-treasurer. Directors include the above and R. H. Ballard, Edison company president; Addison B. Day, president, Los Angeles Gas and Electric Corporation; LeRoy M. Edwards, general counsel of Southern Counties Gas; and W. C. Mullendore, Edison company vice-president.

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230-Kv. Line to Bring Power From Diablo to Seattle—The first 230-kv. transmission line in the Pacific Northwest will be built by the City of Seattle, according to municipal lighting department engineers. The line, which will be approximately 125 miles long, will extend from the Diablo plant of the Skagit River power development project to the south substation in Seattle. Initial plans contemplated operation at 165 kv.

R. C. Clyde Gets Deschutes River Rights for Portland

Portland's city council last month accepted from Ralph C. Clyde, city commissioner, his filings on five power sites on the Deschutes River in central Oregon (ELECTRICAL WEST, Jan. 1, 1931, p. 38), and also passed a memorial to the Oregon Legislature asking that these sites be withdrawn from private entry and reserved to Oregon cities having 300,000 or more population.

Commissioner Clyde had filed on these and other Columbia River sites with the idea of turning these sites over to the City of Portland as the first step in his plan to force the city into a municipal power project.

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Still Plenty of Business

TEN thousand dollars' worth of electrical merchandise in one month is the sales record of each of these two "go-getters" of the Utah Power & Light Company's sales organization—"Jimmie" Hoggan (left) and Gene Dunbar.

The headquarters of both men are at Preston, Idaho, and both work in a widely scattered, agricultural territory, yet Mr. Dunbar's record for one month shows 31 electric ranges, 17 electric refrigerators, 19 electric water heaters, 7 miscellaneous appliances, and 12 range-refrigerator-water heater combination sales, while Mr. Hoggan sold 22 ranges, 14 refrigerators, 11 water heaters, and 6 miscellaneous appliances, and had to his credit also 6 range-refrigerator-water heater combination sales, 1 range-refrigerator combination sale, and 2 range-water heater combination sales.

During the year just past Mr. Hoggan sold 84 ranges, 58 refrigerators, and 17 water heaters; Mr. Dunbar's total was 94 ranges, 46 refrigerators, and 26 water heaters.

Financial

$4,000,000 Budget Adopted by L. A. Gas & Electric Corp.

Principal items of the Los Angeles Gas and Electric Corporation's 1931 construction budget, totaling approximately $4,000,000, include 20 miles of commercial gas mains; 9,500 gas services; 10,000 gas meters; 4,000 gas regulators; 8,000 electric services; 6,600 electric meters, with the necessary poles, wires and conduits; a new supervisory control electric substation of 15,000-kva. capacity; and preparations for changing 16,500-volt high lines to 33,000 volts. This latter project will be completed in 1932. Doubling the capacity of the present high lines is necessary because of the difficulty in getting routes for additional lines, Mr. Day said.

Construction of a district office at Inglewood, at a cost of $175,000, is now under way as one of the most important items among the miscellaneous betterments planned for the year.

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P. G. & E. Common Offered To Present Stockholders

Aggregating a par value of $14,185,550, 567,422 shares of common capital stock is being offered to existing Pacific Gas and Electric Company stockholders in the ratio of one share of new stock at par ($25) for each ten shares of stock now held. The stock may be purchased on an installment basis.

North American Company, Pacific Lighting, and Standard Gas and Electric, the three largest holders of P. G. and E. stock, are exercising their rights to subscribe for the new issue, it is reported. The three utilities named own approximately 40 per cent of the outstanding P. G. and E. common.

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Edison Co. Stockholders to Receive Common Rights

Southern California Edison Company Ltd. has been authorized to issue rights to original preferred and common stockholders of record Feb. 27, 1931, providing for the issuance of 312,000 shares of new common stock of a par value of $7,800,000.

Stockholders will be given the right to purchase new shares at $25 par in the ratio of one new share for each ten shares held. Warrants representing the right to purchase will be delivered about March 25 and the period for subscription under the offer will extend from March 25 to April 20, 1931, inclusive. The new stock will be issued on April 21, 1931, and will share in dividends from that date.

A new feature in this offer will be the provision for time payments. Subscribers will be permitted to make an initial payment of not less than $5 per share, the balance in four installments of $5 each, final payment to be made by Dec. 31.

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Standard Gas & Electric Announces 1931 Budget

A hydro-electric station of 40,000-kw. capacity to be built for The California Oregon Power Company, as well as a generous amount for anticipated line extensions and operations for the San Diego Consolidated Gas & Electric Company, are items in the Standard Gas and Electric Company's 1931 construction budget, which totals $43,596,257, according to John J. O'Brien, president.

During 1930, according to Mr. O'Brien, five major electrical projects of an engineering nature were practically completed, adding 125,500 kw. to the system and bringing the total installed steam and hydro-electric generating capacity in the Standard system to 1,521,203 kw. These extensions and additions to service facilities were projected in view of the increasing demands made upon companies for electrical energy supply. Engineering and construction services for these projects were rendered by Byllesby Engineering and Management Corporation.

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1930 IS RECORD YEAR FOR SALE OF CALIFORNIA UTILITY SECURITIES—Stocks, bonds and notes of public utility corporations in the amount of $302,150,259 were authorized by the California Railroad Commission for sale to the public during 1930. This is the largest amount authorized in any year in the history of the commission, and compares with $103,288,473.78 granted during 1929. A considerable amount of the money received through sales of securities of California utilities in 1930 was used to acquire control of other companies.

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EL PASO ELECTRIC CO.'S CONSTRUCTION BUDGET IS $260,000—Plans of the El Paso Electric Company, El Paso, Texas, for 1931 include the expenditure of $260,000, the major portion of which will be used in making necessary extensions to serve customers and to improve the equipment of the present lines. Transformers, switchboards and enlargements of substations will be included in the new equipment and improvements.

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SAN DIEGO CONSOLIDATED GAS & ELECTRIC COMPANY has been authorized by the California Railroad Commission to issue and sell at not less than 98½ per cent of face value, plus accrued interest, $1,500,000 of 4 per cent gold notes.

P.C.E.A.

Program of Commercial Section Announced

On Feb. 5-6, the Commercial Section of the P.C.E.A. will hold its mid-winter conclave at the Alexandria Hotel, Los Angeles. Beginning with a general assembly at 10:30 a.m. on the first day, at which J. W. Wrenn and G. H. P. Dellman will report on national committee meetings they have attended, the program includes a joint luncheon at noon with the Advertising-Publicity Section, which has prepared a skit, "The Park Bench," an address by W. C. Mullendore, of the Southern California Edison Company Ltd., on "The Power Industry and Political Sabotage," and committee meetings in the afternoon of that day and the morning of the next.

Bureau chairmen will report at 2 p.m. on Feb. 6, after which addresses will be given by E. B. Criddle, past-president of the P.C.E.A.; W. L. Frost, of the Edison company; and R. E. Fisher, of the Pacific Gas and Electric Company. The last two named will outline 1931 business plans of their respective companies.

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Her Costume Won

This little beach lady, dressed by Miss Josefita Grejalva, of the department of engineering design, won the prize for the most original costume in a doll-dressing contest of the Southern California Edison Company women's committee. The dolls were distributed to little girls who otherwise would have gone "childless" at Christmas

THE WOMEN'S COMMITTEE, P.C.E.A., will hold a meeting in Los Angeles in the women's lounge on the twelfth floor of the Los Angeles Gas and Electric Corporation Building at 10 a.m., Feb. 5.

Northwest Association

Refrigeration Campaign Regional Directors Named

At a well attended and enthusiastic meeting of commercial and general executives and other interested persons at Boise, Idaho, Jan. 16, 1931, machinery for the functioning of the Refrigeration Bureau in the Northwest territory was set in motion. George M. Gadsby, president and general manager, Utah Power & Light Company, Salt Lake City, and regional director of the National Refrigeration Campaign for the Northwest, announced the following state directors: For Montana, C. J. Ryan, Montana Power Company, Butte; for Idaho, L. W. Brainard, Idaho Power Company, Boise; for Utah, H. M. Ferguson, Utah Power & Light Company, Salt Lake City; for Oregon, Glenn L. Jackson, The California Oregon Power Company, Medford; for Washington, V. H. Moon, Pacific Power & Light Company, Portland.

Mr. Gadsby outlined the suggested plan for organizing the Bureau nationally and explained the general scheme by which the industry, working cooperatively, expects to sell electric refrigeration to at least 5 per cent of the existing wired homes in 1931. State directors were urged to organize their districts at once so that the joint effort of utility companies, manufacturers, distributors, and dealers would be properly co-ordinated to reach the quota in each state.

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Northwest Will Hold Local Speaking Contest Only

The Northwest Electric Light and Power Association will not participate this year in the National Public Speaking Contest sponsored by the N.E.L.A. Instead the Northwest Association will hold a local association contest with rules slightly different from those under which the national contest will be conducted.

The principal reason for the nonparticipation of the Northwest Geographic Division in the national contest is that the rules of the national contest, requiring a ten to fifteen minute speech, do not encourage as large or wide-spread participation by employees of member companies as do the divisional contests such as have been conducted by this division for several years.

Underground and Submarine Cables to Be Discussed

Latest practices on 66-kv. underground construction and progress on cable design for submarine operation at 110 kv. are among the more important subjects to be presented for discussion at the eighth annual general meeting of the Engineering Section of the Northwest Electric Light and Power Association at Wenatchee, Wash., March 18-20, 1931. In addition, progress during the past year in radio interference research being conducted at the Oregon State College, Corvallis, under the auspices of the inductive co-ordination committee of the Northwest Association, will also be heard. Reports on the latest practice in the use of various pieces of new apparatus now on the market will constitute another subject of considerable interest on the program.

In the course of the three days' sessions, every committee will have a period of time allotted to it in which to present formal papers and reports on various subjects now in the process of study, after which open discussion on all these subjects will be had.

An inspection feature of considerable interest is afforded by the proximity to Wenatchee of the Rock Island project on the Columbia River.

The complete program, with transportation and hotel information, will be published in the March 1 issue of ELECTRICAL WEST.

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DATE SET FOR ACCOUNTING SECTION'S SPRING CONFERENCE—Following a meeting of the executive committee of the Accounting Section of the Northwest Electric Light and Power Association held in Portland recently, R. H. Jones, Utah Power & Light Company, Salt Lake City, Section chairman, announced that the annual spring conference of the Section would be held in Salt Lake City, April 13-14, 1931. All committees will present for discussion reports on subjects now being studied. Some of these subjects have been assigned by the national section while others have been chosen for a particular significance to member companies in the Northwest. The program will be announced in a later issue.

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COMMERCIAL SECTION TO MEET MARCH 16-18—The annual spring meeting of the Commercial Section of the Northwest Electric Light & Power Association will be held in Spokane, Wash., March 16-18, 1931, according to announcement of George E. Sullivan, Portland General Electric Company, Section chairman. The meeting will follow the general outline of those of recent years in that all sessions will be general sessions at which each committee will present the results of its study on some phase of commercial development within its scope. The complete program will be announced in a later issue.

Meetings

Coming Events

International Association of Electrical Inspectors, Northwest Section—Sixth annual convention at Salem, Ore., Oct. 5-7, 1931.

National Electric Light Association—Fifty-fourth convention and exhibition, Atlantic City Auditorium and Convention Hall, Atlantic City, N. J., June 8-12, 1931.

Northwest Electric Light and Power Association—Annual convention, Boise, Idaho, June 17-20, 1931.

Accounting Section meeting at Salt Lake City, Utah, April 13-14, 1931.

Commercial Section meeting at Spokane, Wash., March 16-18, 1931.

Engineering Section meeting at Wenatchee, Wash., March 18-20, 1931.

Pacific Coast Electrical Association—Annual convention at Hotel Del Monte, Del Monte, Calif., June 24-26, 1931.

Commercial Section meeting, Los Angeles, Feb. 5-6, 1931.

Engineering Section meeting, Fresno, Calif., March 11-13, 1931.

Western Metal Congress and Western Metal and Machinery Exposition—Civic Auditorium, San Francisco, Feb. 16-21, 1931.

Rocky Mt. Group Agrees on Good-Will Advertising

Public utilities in the Rocky Mountain region will have a message to broadcast to customers during 1931. "Institutional" advertising will tell a timely, educational story designed to offset misstatements concerning the industry, and to acquaint the public with operating problems and the methods adopted to overcome them. Merchandising copy will tie in with this program.

This general plan of procedure was agreed upon by the advertising and publicity committee of the Rocky Mountain Division, N.E.L.A., after a two-day session in Denver Jan. 14-15. In the opinion of this group, "we have been devoting too much time and thought to what is in our minds; the time has come for us to concern ourselves with what is going on in the customers' minds."

Executives from practically all utility organizations in New Mexico, Colorado, and Wyoming participated in the conference, concurring in a program to acquaint the public with the facts that (1) utilities are vital factors as community builders, (2) utilities contribute heavily to public revenue by payment of taxes, and (3) utilities are potent factors in enabling citizens of the United States to maintain the world's highest standard of living.

Frank R. Jamison, advertising and publicity director for Public Service Company of Colorado, as chairman, presided over the deliberations.

Electrical Bureau and P. G. and E. Sales Are San Francisco Meeting Subjects

FIVE hundred men, representing every branch and interest in the electrical industry in northern California, met at the Commercial Club, San Francisco, Jan. 6, to hear the plan of operation of the reorganized California Electrical Bureau and the announcement of the 1931 sales plan of the Pacific Gas and Electric Company, featuring dealer sales. Clyde L. Chamblin, as the northern regional chairman of the new Pacific Coast Electrical Bureau, was toastmaster.

R. M. Alvord, General Electric Company, San Francisco, who had evolved the new organization plan (see chart on p. 7, ELECTRICAL WEST, Jan. 1, 1931) from a preliminary theory fathered by the late Charles T. Hutchinson, described the new plan of operation and the inter-relation of its various regional and activity committees and the other organizations in the electrical industry. He described the new Bureau as the operating machinery whereby the results of studies and plans worked out by the Pacific Coast Electrical Association, the Committee on the Relation of Electricity to Agriculture, and others, could be put to work.

Announcement of the posthumous award of the James H. McGraw Medal for Co-operation to Charles T. Hutchinson, who for many years was chairman of the Bureau, was made by Mr. Chamblin.

Dr. Ira B. Cross, professor of economics, University of California, reviewing past business cycles, analyzed the causes for the present business recession, debunked several "man-on-the-street" theories as to the causes of it, and then pointed to the many indications that the bottom had been reached. He predicted higher wages as a stimulus to greater consumption. Small inventories on hand, building behind in normal requirements, low money rates, and more important, a return of Americans to hard digging, were all promising of a return of business activity in the near future, he pointed out.

Hugh M. Crawford, general sales manager, P. G. and E., and chairman of the co-ordinating committee studying the dealer-power company merchandising situation, reported on the work of that committee and promised a definite report shortly.

R. E. Fisher, vice-president in charge of public relations and sales, P. G. and E. Company, then outlined the dealer selling plan of his company for this year. He characterized the meeting as the rallying point of an industry facing a depression and determined to win its objectives despite it. " 'Live and let live' is a good policy," he said, "but 'live and help live' is a better policy." In this spirit, he announced, the new sales plan had been developed. It considered that the power company had three groups of salesmen for it: Its 16,000 employees and their families, the many hundreds of dealers established in its territory, and its sales force of 500 men. The latter, in the San Francisco Bay area, are to work on a commission of $2 for every kilowatt of heavy-duty appliance load signed, whether sold by the dealer or the company. This announcement brought applause.

Summarizing the market expected to be created in P. G. and E. territory for the electrical industry by its program, Mr. Fisher declared that a $48,790,000 total would be developed. Of this, construction materials would amount to $21,000,000; materials for distribution additions and betterments, $3,850,000; a market for current consuming equipment and appliances of all kinds, of $21,483,000; and contractors' wiring materials, exclusive of labor, of $2,457,000.

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Ray W. Turnbull Honored At Farewell Luncheon

In tribute to Ray W. Turnbull, since 1926 Pacific Coast district manager for the Edison General Electric Appliance Company, about 55 members of the electrical industry gathered at a luncheon in the Palace Hotel in San Francisco on Jan. 15 to bid him Godspeed on the eve of his departure for Chicago to take up his new duties as vice-president of the company in charge of sales.

It was an informal gathering marked by the cordial goodfellowship of men who knew one another well and who met to honor a man whose sterling qualifications had won their admiration and whose genial personality had made him a universal favorite.

George C. Tenney, editor of ELECTRICAL WEST, presided at the meeting. Graceful tributes were paid by R. E. Fisher, vice-president of the Pacific Gas and Electric Company in charge of public relations and sales, and by P. H. Booth, vice-president of the Edison General Electric Appliance Company, who, in recounting his reminiscences of Mr. Turnbull's career, emphasized the fact that Mr. Turnbull had first conceived the idea of the electric home. At that time he was a salesman for the electric appliance department of the General Electric Company (before the merger of the Hotpoint Company with the General Electric Company), and traveled all over the West giving an illustrated talk, "The House Without a Chimney."

Ernest Ingold, president of Ernest Ingold, Inc., and also president of the San Francisco Electrical Development Leaue, for the assembled group presented two etchings of California scenes to Mr. Turnbull, who combined in a characteristic speech his thanks and his farewell.

A.I.E.E. in San Francisco Hears Dr. Arnold

H. D. Arnold, Ph.D., ScD., director of research of the Bell Telephone Laboratories, gave to the members and guests of the A.I.E.E. who filled the Pacific Gas and Electric Company's auditorium on Friday evening, Jan. 23, a glimpse of the achievements and problems of the men who work with the most minute of nature's forces. The title by which Dr. Arnold chose to identify this discussion of atoms, mag-

DR. H. D. ARNOLD

natons, ions and electrons was "The Small but Mighty," and by showing how the recent advance in science has been definitely dependent on a knowledge of the motions and composition of these tiny bodies, he more than justified his statement that, small as they may be, further study and investigation will probably prove them to be the most powerful ally that man has commanded in his struggle for advancement.

Particularly in telephone communication, where infinitesimal amounts of energy must be periodically amplified when transmitted over long circuits, have the forces of electronic phenomena been utilized advantageously, Dr. Arnold pointed out. Continued research, he said, has led to the development of highly efficient vacuum tubes and materials to further this end. A recent development of the Bell Laboratories is "Permaloy," a composition of iron and nickel which has practically no hysteresis loss.

Throughout the lecture, Dr. Arnold made lucid comparisons so that the average person, untrained in the field of electronics, could readily grasp the unbelievably small forces which are commanding the attention of modern research. It seems almost preposterous that electrons, which stagger the imagination and defy description in their infinitesimal smallness, should make sufficient noise as they fall on the plate of a vacuum tube to limit definitely the distances through which the voice can be transmitted, and yet the speaker showed that the elimination of this noise presents another problem without the solution of which further advancement will be limited.

Fortunately, research in the field of this fascinating subject brings forth information that is applicable to all branches of science, with the result that chemistry, therapeutics, astronomy, physics, biology and all other specialized branches of investigation directly benefit from the increased knowledge of these particles which literally make up our universe. The key to amazing future developments still lies hidden in the complexity of their make-up, challenging research to still further achievements.

Dr. Arnold's San Francisco address followed similar talks before sections of the Institute in the Northwest during the month of January. He addressed the Los Angeles section during the succeeding week.

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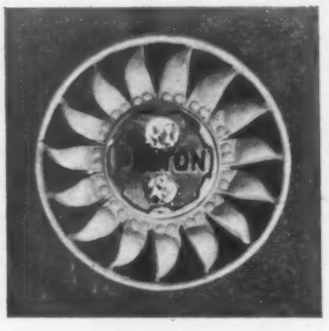
Loyalty Emblems Reward Pelton Employees

Thirty-seven employees of the Pelton Water Wheel Company received medals in recognition of continuous service for periods ranging from ten to 35 years at the company's annual dinner at the San Francisco Engineers' Club Jan. 15.

Henry L. Wallace, in continuous service since May 1, 1896, received the first award, consisting of a gold pin representing a waterwheel and inset with two diamonds. Waldo F. Allen, who entered the company employ in 1899, also received the two-diamond loyalty emblem. Seven who have



The 30-35-year two-diamond emblem

served the company from 25 to 30 years received a similar emblem set with one diamond. Four more were recipients of a gold loyalty pin for 20 to 25 years' service, eight received a silver emblem in recognition of 15 to 20 years of service, and sixteen additional members were awarded a bronze emblem for having served 10 to 15 years.

President E. M. Breed, after an inspiring address, personally presented the medals, following which he in turn was presented with the 15-year silver medal by Ross L. Mahon, vice-president and general manager.

All entertainment features at the dinner were furnished by talent within the Pelton organization, and consisted of impersonations, vocal and instrumental numbers, and selections by the Pelton male quartet.

Furnaces, Welders on Show At Machinery Exposition

Electric welding machinery, industrial furnaces, and temperature indicating and controlling instruments will occupy major exhibit space at the Western Metal and Machinery Exposition to be held in connection with the Western Metal Congress at the Civic Auditorium, San Francisco, Feb. 16-21.

Among manufacturers who will exhibit are the following, with the products they will have on display:

Ajax Electrothermic Corporation, Trenton, N. J.—high-frequency furnaces; Black & Decker Manufacturing Company, Towson, Md.—portable electric tools, including heavy-duty grinders and buffers and high-cycle tools; The Bristol Company, Waterbury, Conn.—electric pyrometers, controlling and recording instruments, thermometers, and gages; Ding's Magnetic Separator Company, Milwaukee, Wis.—magnetic separators; Electrical Refractories Company, East Palestine, Ohio—refractories for supporting electric heating elements in furnaces, ranges, and miscellaneous heating furnaces; George J. Hagan Company, Pittsburgh, Pa.—industrial furnaces; Hoskins Manufacturing Company, Detroit—an industrial type electric furnace with pyrometer equipment; Leeds & Northrup Company, Philadelphia—electric furnaces and electric temperature indicating and controlling instruments; Lincoln Electric Company, Cleveland—hand and automatic electric welding machines and motors; Taylor-Winfield Corporation, Warren, Ohio—automatic and hand-operated electric welding machines; Victor Welding Equipment Company, San Francisco — electric welding machines; Globar Corporation, Perth Amboy, N. J.—non-metallic electric heating elements and terminals.

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Washington C.R.E.A. Plans Intensive Study Year

A program of intensive research for 1931, including as a major feature a rural electrification short course, was adopted at the annual meeting of the Washington Committee on the Relation of Electricity to Agriculture, recently held in Spokane. Dr. E. O. Holland, president of the State College of Washington, is chairman of the committee.

The rural electrification short course, to be held in February, will deal with practical utilization of electricity on Washington farms.

Other features of the program for the coming year are: Electric irradiation of dairy cows to supply artificial sunlight during the winter months; development of electric hotbeds; elevation of grain by electric motors; and orchard sprinkling by electric motors.

These projects are to be studied at the state college and at the Western Washington Experimental Farm of the state college, at Puyallup, Wash.

Personals

Will H. Fischer Now Edison Co. Vice-President

WILL H. FISCHER, associated with the Southern California Edison Company Ltd. since 1921 as assistant vice-president and later as assistant to the president, was elected vice-president in charge of public relations at a meeting of the board of directors Dec. 19.

In announcing the election of Mr. Fischer, R. H. Ballard, president of the Edison company, said: "Mr. Fischer's host of friends throughout the state appreciate his qualities which have appealed to us during his nearly ten years of association with us and which fit him in every way for this important office."

As a young man Mr. Fischer engaged in newspaper work, serving as reporter and editorial and feature writer on papers in San Francisco and Los Angeles, and was for some time editor and manager of the *Humboldt Times* of Eureka, Calif. Prior to joining the Edison company he was engaged in tax research work.

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Si Larsen Is Hubbard Co. Northwest Manager

S. P. ("SI") LARSEN, for the past four years Northwest manager of the Line Material Company, has been made district sales manager in the Northwest for Hubbard & Company, pole line hardware manufacturers of Pittsburgh, Chicago, and Oakland. He succeeds H. L. Manny, whose resignation to become manager of the Seattle office of Maydwell & Hartzell, Inc., was announced last month in ELECTRICAL WEST. Mr. Larsen will transfer his headquarters from Portland to Seattle.

Before coming to the Northwest, Mr. Larsen represented the Line Material Company for a year in the Southern states. While Northwest manager he has also represented the Canadian Line Material Company in British Columbia. He has spent his entire business career in various branches of the electrical industry in different parts of the country. After leaving school, he was for two years with the Wisconsin Traction, Light, Heat & Power Company, at Appleton, Wis., following which he spent a year in the electrical contracting business. He then joined the Central Electric Company, General Electric Company distributors, representing the firm first in the "Loop" district of Chicago, later in Kansas, Missouri, Oklahoma, and Wisconsin.

Clinton T. Hurd has been appointed to succeed Mr. Larsen as Northwest manager of the Line Material Company, and will maintain headquarters in Portland. Mr. Hurd was formerly in the engineering department of the Portland General Electric Company.

WILL H. FISCHER

GUY A. BARKER

B. M. TASSIE

Guy Barker of Johns-Manville Goes to Chicago

GUY A. BARKER, sales manager of the power products department, Pacific Division, Johns-Manville Sales Corporation, with headquarters in San Francisco, on Feb. 1 becomes sales manager of the power products department in the company's Western division, with headquarters in Chicago.

Mr. Barker's association with Johns-Manville in San Francisco dates from 1921, when he returned to the Pacific Coast after a two years' service as chief engineer for the Central Teresa Sugar Company in Cuba. He is a graduate of the University of California, class of 1914, and in that year entered the employ of the Pacific Gas and Electric Company. He served in the army during the war, and during 1922-23 was a member of the Industrial Accident Commission.

Mr. Barker's promotion will be a distinct loss to the electrical fraternity of San Francisco. He has been an active worker in the San Francisco Electrical Development League, a member of its board of directors for two years, and has served as chairman of its program committee.

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R. J. Cordiner's Selling Record Earns Promotion

RALPH J. CORDINER, who has succeeded Ray W. Turnbull as Pacific Coast manager of the Edison General Electric Appliance Company, with headquarters in San Francisco, has been selling Hotpoint appliances in the Northwest since 1922. He was associated first with the Edison Electric Appliance Company in Portland, and in 1926 was transferred to Seattle as Northwest representative. Prior to joining the Hotpoint organization he was in charge of merchandising in the Walla Walla (Wash.) district of the Pacific Power & Light Company.

Mr. Cordiner comes to California with a splendid record behind him in the Northwest, both in Hotpoint sales and general industry development.

RALPH J. CORDINER

S. P. LARSEN

B. M. Tassie Advanced By Manning Bowman & Co.

RECENT promotion by Manning Bowman & Company of B. M. Tassie, following the death of Reginald Tracy, president of the company, makes Mr. Tassie vice-president and general manager.

Mr. Tassie left the Pacific Coast last June after serving as manager of that district for several years, with headquarters in San Francisco, to become assistant to the president, and manager of the Manning Bowman factory at Meriden, Conn.

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M. J. MURPHY has joined the merchandise department of the General Electric Company in Los Angeles as an appliance division specialist in the southern California and Arizona territory. Mr. Murphy was formerly with the Majestic Electric Appliance Company in Los Angeles.

League President Is Westinghouse Co. Veteran

L. M. ("LARRY") CARGO, Mountain states representative of the Westinghouse company, whose election to the presidency of the Electrical League of Colorado is announced elsewhere in this issue of ELECTRICAL WEST, is a real "old timer" in the elec-

L. M. CARGO

trical business, having been continuously with the same firm for 42 years, 33 of which have been spent in the Rocky Mountain region. He introduced alternating current motors to the mining industry in Colorado and became the first president of the Electric Club, pioneer adjunct of the Denver Chamber of Commerce. The Electrical League of Colorado is a direct descendent, through various stages of change, of the Electric Club which Mr. Cargo headed so many years ago. His election came as a complete surprise, the new incumbent being the only league member not aware of his selection beforehand.

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J. R. Murphy Now Spokane Manager, General Electric

ANNOUNCEMENT has been made of the appointment of J. R. ("Pat") Murphy as manager of the General Electric Company at Spokane, succeeding Ben Olsen, who has been transferred to the Indianapolis office.

Mr. Murphy goes to Spokane from Seattle where he had been sales manager of the company since 1923. He was actively associated with civic affairs in that city and had taken a prominent part in the activity of the electrical industry, particularly in connection with the construction of the new Cascade tunnel and main line electrification of the Great Northern Railway.

Prior to joining the company in Seattle Mr. Murphy had been a representative of the International General Electric Company with headquarters at Manila, P. I. Previous to his association with the General Electric Company he was connected with the Southern Railway Company, Norfolk & Western Railway, and the Consolidated Gas, Electric Light & Power Company, of Baltimore, Md.

Roy Wilkins an Official of Pacific Electric Mfg. Co.

Ratification by the stockholders of the Pacific Electric Manufacturing Company, San Francisco, of the appointment of Roy Wilkins as vice-president in charge of engineering, has been announced by officials of the company. Mr. Wilkins joined the organization of the Pacific Electric Manufacturing Company on Jan. 1, 1928, to act in a consulting capacity. For fifteen years prior to that date he had been associated with the Pacific Gas and Electric Company, and at the time of his resignation was assistant engineer in the division of hydro-electric and transmission engineering.

Mr. Wilkins has conducted many hydro-electric and high-tension experiments and is well known in the industry for his corona research and his knowledge of high-voltage oil circuit breakers. He has always taken an active part in the affairs of the American Institute of Electrical Engineers and the Pacific Coast Electrical Association.

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J. G. CORRIN, who has been with the transformer division of the Allis-Chalmers Manufacturing Company in Los Angeles for several years, has resigned from Allis-Chalmers to join American Brown Boveri Company, Inc., in New York City as a special transformer representative. Mr. Corrin came to the Pacific Coast from New York seven years ago; he was formerly district manager for the Pittsburgh Transformer Company, later joining Allis-Chalmers when that company took over the Pittsburgh company.

JOHN S. LAPP, general manager, Lapp Insulator Company, Le Roy, N. Y., after attending a general sales conference last month of the James R. Kearney Corporation at St. Louis, Mo., came to the Pacific Coast, accompanied by H. F. Hartzell and E. S. Condon, of Maydwell & Hartzell, Inc., distributors of the Lapp line in this territory, arriving in Los Angeles Jan. 28. It is Mr. Lapp's intention to spend a few weeks at the various offices of Maydwell & Hartzell on the Coast before returning to the Lapp factory.

HARVEY H. HOXIE has been appointed San Francisco manager of the Joslyn Company of California. Mr. Hoxie has been associated with the San Francisco office of the company for some time; he succeeds R. G. Holabird as manager.

A CORRECTION—Milo Cain, illuminating engineer with Coast Counties Gas & Electric Company, Santa Cruz, Calif., has been made district manager at Gilroy instead of at Hollister as announced in the Dec. 1 issue of ELECTRICAL WEST.

PAUL LUCKENBACH, of the ultra-violet lamp division of the merchandising department, General Electric Company, is making a tour of the Pacific Coast and during the past month has addressed meetings of the Illuminating Engineering Society in San Francisco and other groups on the subject of "Artificial Sunlight." Mr. Luckenbach came to this country from Germany in 1923 where he had worked for several years in various experimental laboratories and had been responsible for the development of high-frequency generators and apparatus for wireless telegraphy and telephony as well as the first diathermy machine and many improved types of X-ray machines and other electro-medical devices. As a member of the firm of Luckenbach & Hallberg, Inc., of New York City, Mr. Luckenbach engaged in the manufacture of ultra-violet lamps in 1927. Two years later he associated himself with the General Electric Company.

Obituary

Death Follows Promotion Of Charles H. Coulter

Charles H. Coulter, 50 years of age, veteran member of the organization of the Southern California Edison Company, Ltd., and for ten years manager of the company's Vernon, Calif., district, died Jan. 4 in Los Angeles. His death was due to pneumonia and followed an announcement made Dec. 30, at the annual meeting of the company's district managers, that he had been appointed assistant to the vice-president in charge of public relations.

Mr. Coulter was associated with the Great Western Power Company in San Francisco about 1910 as purchasing agent and general storekeeper.

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W. W. FRAZER, well known electrical engineer and contractor of Vancouver, B. C., and past president of the Vancouver Electric Club, died recently at his home in Vancouver, at the age of 55.

WILLIAM OTTWAY PECK, JR., a member of the sales staff of Herberts-Moore Machinery Company, San Francisco, engaged in handling the sale of electric trains and equipment, died in that city Jan. 12 after a brief illness. Mr. Peck formerly had been a member of the San Francisco sales staff of the Westinghouse Electric & Manufacturing Company.

HARRY E. DIBBLE, steam engineer at the Seal Beach station of the Los Angeles Gas and Electric Corporation, died suddenly Dec. 23, 1930.

1930 Production Increase Shown in Some Lines

Classes of electric apparatus which created new high figures in 1930 for both the volume and the dollar value of production as compared with any previous year, according to a statement by John Liston in the January issue of the *General Electric Review*, included electric refrigerators, high tension cable, railway electric locomotives and electric equipment for street railway and railroad motor cars, electric propulsion equipment for merchant ships, and mercury arc power rectifiers.

Building construction during 1930 used electric welding to a greater extent than heretofore, according to Mr. Liston, and 84 cities and towns in the United States were added to the list of those permitting the use of this method of construction. The tallest building so far erected by electric welding is nineteen stories in height. Automatic welding machines, including those applying the atomic-hydrogen process, were improved during the year for industrial use.

All the apparatus referred to, of course, are products of the General Electric Company, but these cover such a wide range that the report serves as an indication of the general progress in the electrical manufacturing industry as a whole.

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THE RADIO POWER MANUFACTURING COMPANY has moved into its newly constructed plant at 427 Avalon St., Wilmington, Calif., from its old location at 1447 E. Anaheim St. The firm specializes in the design and manufacture of a.c. and d.c. motor and gas-engine-driven radio power units. The sets are designed especially for marine use or for supplying 110-volt, 60-cycle current for operating a.c. radio sets, power amplifiers, neon signs, and other devices.

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Tough Gang Holds Up Range Sales Manager

WHEN W. A. Dannenhauer, manager range sales promotion department of the Edison General Electric Appliance Company, Chicago, visited Provo, Utah, and attended a sales meeting of the Utah Power & Light Company there, he was "put on the spot" in the approved Al Capone gangster fashion. Mr. Dannenhauer is shown at the extreme right in the time honored attitude of the helpless victim, while R. M. Bleak, superintendent of lighting and appliance sales for the power company, with headquarters in Salt Lake City, plays the part of the "Master Mind."

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WEBER ELECTRIC CONSOLIDATES MANUFACTURING AND SALES—Manufacturing and selling activities of the Weber Electric Company, of Schenectady, N. Y., were consolidated on Jan. 1 For the past 30 years Henry D. Sears, of Boston, has acted as general sales agent of the company. He is now located at the company's general offices at Schenectady as vice-president in charge of sales, while Frank V. Burton continues as sales manager. District sales offices will be continued in Los Angeles and Seattle, as well as in various Eastern cities, under the same personnel as at present.

GENERAL ELECTRIC SUPPLY CORPORATION, Seattle, on a bid of $21,094, has secured the contract for furnishing 25,000 lb. of weatherproof copper wire for the Seattle City Light Department.

CANADIAN FACTORY FOR CURTIS LIGHTING—Curtis Lighting, Inc., announces the organizing of Curtis Lighting of Canada, Ltd., with factory, office and display rooms at 260 Richmond St., West, Toronto, Ont. Melvin C. Wilt, formerly Curtis resident engineer at Cleveland, is managing director of the new company.

VOSS BROS. MANUFACTURING COMPANY, Davenport, Iowa, has announced the appointment of Listenwalter & Gough, Inc., Los Angeles, as exclusive distributors of the Voss washing machine in southern California, and Kaemper-Barrett, San Francisco, in northern California.

Street Lighting Units Displayed Indoors

AMONG the unique features of the new quarters of the Associated Wholesale Electric Company, 1111 Santee Ave., Los Angeles, is the method of displaying its street lighting units. The main floor of the two-story building has a mezzanine at the rear, on the railing of which the street lighting units are set up. They can be seen from the floor below or examined more closely from the mezzanine. The mezzanine also contains range and appliance displays.

On the main floor in the display quarters the shelf stock is kept. Offices are on the second floor. The large stockroom at the rear occupies three floors. Heavy pole-line hardware and pipe stock are on the main floor, which is served by a truck entrance at the rear; lamp stocks are kept on the mezzanine, package goods on the second.

Winning Honors for Anaconda

THIS basketball team of the Anaconda Wire & Cable Company has been causing considerable discomfort among other teams in the new San Francisco Civic League. In the back row, left to right, are W. Kuhn, R. Geiger, Bob Evans, coach, C. Stewart, and L. Gibson. Front row: L. Lethine, A. Tracy, H. King, S. Lee, and A. Hughes. All but two are members of the San Francisco office of the company. The squad has already played against teams of the Gardner Electric Manufacturing Company, Pacific Gas and Electric Company, Union Oil Company, and Byron Jackson Pump Company.

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THE ILG ELECTRIC VENTILATING COMPANY, through its Pacific Coast manager, Andrew G. Orear, of Los Angeles, has announced the opening of a branch office in San Francisco with E. D. Price as manager. The territory will comprise northern California. For the past two years Mr. Price has been associated with the Westinghouse Electric Supply Company in Chicago in charge of its ventilation business. For five years prior to that, he was a ventilation specialist for the Westinghouse Electric Supply Company in Los Angeles. A year ago the company opened a branch office in Seattle in charge of W. B. Michaels.

FULLER-LEHIGH AND BABCOCK & WILCOX ACTIVITIES CO-ORDINATED—Manufacturing operations of the Fuller-Lehigh Company are shortly to be transferred from Fullerton, Pa., to the Barberton, Ohio, works of The Babcock & Wilcox Company. Management, engineering and sales departments will move to New York City. The corporate identity of the Fuller Lehigh Company will be maintained, according to an official announcement, but in some cases the personnel will be merged with that of the parent company.

I-T-E REPRESENTATIVES AT ANNUAL SALES MEETING—Otto Demmert and Burton R. Stare, Los Angeles and Seattle representatives respectively of the I-T-E Circuit Breaker Company, and E. S. Moreland, of the San Francisco office of Oliver B. Lyman, I-T-E representative in that city, attended the annual sales meeting of the I-T-E company in Philadelphia during the week of Jan. 12.

THE LAPP INSULATOR COMPANY, of Le Roy, N. Y., announces that Maydwell & Hartzell, Inc., with offices in Los Angeles, San Francisco, and Seattle, were appointed Jan. 1 to represent the Lapp line in the states of California, Oregon, Washington, Idaho, Nevada, and Arizona. The Lapp Insulator Company manufactures a complete line of suspension and pin type insulators and a wide variety of special porcelain pieces. In addition, recently they have developed the fog type insulator design which has been used extensively on the Pacific Coast.

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Shipping Clerk to Director

Ralph B. Peterson, district sales manager for Garnett Young & Company, manufacturers' agents of San Francisco, has been elected a director of the company.

Starting in the shipping department of the Telephone Electric Equipment Company (predecessor of Garnett Young & Company) in 1907, Mr. Peterson worked his way by successive stages to a position on the sales force. He became assistant district sales manager of the San Francisco district in 1925, and three years later succeeded Arthur E. Rowe as manager, Mr. Rowe having to retire on account of ill health.

RALPH B. PETERSON

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New Phoenix Store of Kelvinator Distributor

IN KEEPING with a general expansion program, the Electrical Equipment Company, of Phoenix, Kelvinator distributor, recently completed the remodeling of its new store. Included in the new showrooms is a "gold room" devoted exclusively to radio. Other sections of the store are allotted to other electrical equipment, such as washing machines, ironers, and small appliances, with a complete electrical shop in the rear. Under the direction of Sam Kahan, general manager, and M. C. Jennings, assistant general manager, the organization is embarked on an extensive sales program. Electrical Equipment Company is also co-owner of radio station KTAR.

Contractor Dealer Inspector

Southwest Inspectors' Committees Named

Committees of the I.A.E.I., Southwestern Section, for the year 1931, have just been announced by President Ralph W. Wiley. The place for the annual meeting this year will be announced as soon as the location is decided definitely by that committee.

COMMITTEES FOR 1931

Articles of Association—R. H. Manahan, chairman; F. A. Short.

Clearing House—B. C. Hill, chairman; C. E. Hardy, G. E. Kimball, C. W. Mitchell.

Ordinances—J. M. Evans, chairman.

(*a*) Examinations and Licenses—Arthur Veit, chairman; D. H. Alexander, James McConahey.

(*b*) Electrical—H. N. Beecher, chairman; A. J. Key, Louis DeYoung, O. Barnwell.

State Safety Orders—C. E. Hardy, chairman; G. E. Kimball, F. A. Short, H. G. Ufer.

Art. 1—H. N. Beecher, chairman; F. A. Short, C. W. Beaton.

Art. 2—O. Barnwell, chairman; J. H. Crannell.

Art. 3—W. H. Talbott, chairman; H. B. Wells, Charles Stevens.

Art. 4—B. C. Hill, chairman; S. C. Curtis, T. E. Lackyard, C. T. Coyle.

Art. 5—D. H. Alexander, chairman.

(*a*) Sections 500, 511, 512, 513—C. E. Hardy, chairman; J. M. Buswell, H. Grondorf, A. E. Cohn, H. L. Gerber.

(*b*) Sections 501, 502—J. I. Dixon, chairman; H. C. Stevens, J. E. Foran.

(c) Sections 503, 508—R. B. Maxwell, chairman; M. C. Sandles, E. H. Collins.

(*d*) Sections 504, 506, 514—C. B. Pickett, chairman; E. P. Lukens, F. H. McMahan,

(*e*) Sections 505, 507, 510—T. C. Coombs, chairman; C. A. Blackburn, C. V. F. Taylor.

Art. 6—E. H. Snedaker, chairman; E. J. Crawford, J. W. Wrenn, R. J. Larrabee, H. C. Rice, R. R. Cowles, O. M. Collins, K. J. Bickel, C. R. Meikel.

Art. 7—J. A. Miller, chairman; J. H. Park, H. G. Beattie.

Art. 8—F. A. Short, chairman; C. C. Bonebrake, G. J. Tansey, J. E. McDonald, R. M. Coon.

Art. 9—G. E. Kimball, chairman; C. E. Hardy, E. M. McLaughlin, W. E. Pennycook.

Art. 10—J. M. Webster, chairman; E. C. Gerrey, C. H. Romick, F. C. Colville.

Art. 11—E. J. Crawford, chairman; Jerry Fordyce, G. F. McKenzie, W. P. Roche.

Art. 12—R. J. Larrabee, chairman; F. Mellor, J. P. Murphy, O. K. Jones (S. F.).

Art. 13—H. G. Ufer, chairman; J. G. Moyen, J. L. Mullenbach, E. Zinsmeyer.

Art. 14—A. V. Youens, chairman; W. B. Smith, H. C. Moore.

Art. 15—J. W. Wrenn, chairman; J. J. Wharton, E. H. Salbach, A. E. Gilkey.

Art. 16—A. C. Veit, chairman; W. W. Hicks, P. P. Pine, H. H. Douglas, W. McFadden.

Art. 17—H. N. Carey, chairman; F. L. Murray, N. J. Sigrins, H. C. Noble, E. W. Fischer.

Art. 18—G. L. Walters, chairman; Darro McGowan, J. Dannheiser, E. H. Snedaker, L. F. Boerner.

Art. 19—F. H. Vore, chairman; D. D. Smith, H. J. Jacobs, O. K. Jones (S. F.).

Art. 30—G. E. Kimball, chairman; B. C. Hill, F. W. C. Butow, L. W. Whitton, H. L. Gerber.

Art. 31—R. H. Manahan, chairman; W. O. Packard, C. M. Hoyt, R. J. Lyon, L. W. Whitton.

Art. 32—J. R. Douglass, chairman; R. M. Coon, H. G. Ufer.

Art. 33—F. R. Ellison, chairman; J. O. Murphy, C. A. Murphy, W. J. Kennedy, E. Brothers.

Art. 34, 35, 36, 39—E. M. McLaughlin, chairman; C. W. Beaton, J. McConahay, K. J. Bickel, W. H. McKinley.

Art. 37—F. A. Short, chairman; J. J. McTeigh, W. Stracke, H. C. Weisenburger, F. H. Vore.

Art. 38—H. V. Dobson, chairman; W. M. Kennedy, M. A. deLew.

Art. 40—C. W. Beaton, chairman; C. L. Heney, L. C. Richmond, C. Drathman.

Art. 50—Maurice Scott, chairman; W. H. Stevenson, C. H. Jenkins.

Art. 60—R. M. Coon, chairman; V. W. Hannum, H. L. Hutchinson, C. P. Murphy, J. Dannheiser.

Range Installations—W. E. Brothers, chairman; R. J. Larrabee, J. R. Douglass.

Note: For addresses, consult I.A.E.I. Year Book.

▼

Converted

WHEN L. G. JEFFREY, proprietor of the Electrical Construction Company, of Fresno, Calif., bought this attractive house, he found it to be not up to Red Seal standards. Immediately he wired it to conform to the standard and over, in order that he might point to his own home as an example for his customers.

"Hobe"

HOBART BARNES, over whose signature as assistant general manager of the Association of Electragists, International, go many of that organization's most useful data and development publications. A Cornell graduate, "Hobe" Barnes and his brother were proprietors of Barnes Electric Company, in Pasadena, Calif. Later, "Hobe" became assistant executive secretary for the California Electragists, Southern Division. Then Laurence W. Davis called him to New York to be his assistant. "Another local boy who is going places," his Western friends say of him.

Modernizer

LOUIS KALISHER, winner of the 1930 James H. McGraw award for the contracting industry. Because of his successful industrial modernization program in New York City, which brought about extensive electrical repair and revamping work during a slack building period, his was considered the greatest contribution to the industry for the past year. Similar campaigns are being contemplated for other areas, even on the Pacific Coast. Mr. Kalisher spoke at several meetings of motor specialists and manufacturers' representatives in Los Angeles early last year on a visit to that city. He is chairman of the national Motor Section of the Electragists.

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WALLACE ELECTRIC COMPANY, LTD., 427 Seymour St., Vancouver, B. C., has just taken out incorporation papers at Victoria, B. C. The company is capitalized at $10,000, and officially classified as wholesale and retail dealers in electrical and radio equipment. The firm has been engaged in business in Van couver for some years past in the contracting field, branching into the retailing end of the business about one year ago.

H. C. REID COMPANY, Electragists of San Francisco, recently completed the electrical installation at the new Women's City Club at Berkeley, Calif. The building is unusually complete from an electrical standpoint.

STOVER & BARNES, formerly of Forrest Ave., Laguna Beach, Calif., have moved into a new store in a new building recently completed at the corner of Coast Blvd. and Ocean St. A radio department has been added, with A. G. Mummy in charge.

SAN FRANCISCO ELECTRAGISTS, on Dec. 18, last 1930 meeting, presented Wm. A. Cyr, volunteer secretary for the group during the past six months, with a handsome Telechron clock in token of their appreciation.

TWENTY FIRMS comprising Tacoma's Electrical Contractors and Dealers Association have adopted a seven-hour working day to relieve unemployment among electrical workers.

Denver Contractors Make Labor Agreement

With one exception, all electrical contractors of Denver who have been employing members of Local Union No. 68, I.B.E.W., have signed a new labor agreement prepared by a joint committee of the two organizations.

While wage scales have remained the same, union members will benefit by old age pensions and disability and death insurance provided by the employer in a group plan. Contractors have benefited by rule changes concerning overtime work, allowing shifts to use labor-saving devices, method of arbitrating differences which may arise, and the observance by union men of installing wiring under requirements of an Electrical Approval Bureau. The latter furnishes both customer and contractor protection.

If no change is made within two years, the agreement automatically is in effect from year to year. Changes may be made by a joint committee.

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RED SEAL wiring certificates had been issued to 2,905 buildings in Vancouver, including 1,748 houses, up to Dec. 1, the British Columbia League report shows. Certificates were also issued to 42 homes in duplex blocks and 1,115 suites in 96 apartment houses. Applications then awaiting inspection were for 30 homes, 2 duplexes, and 5 apartments.

GEORGE C. FOSS, electrical contractor of Sacramento and member of the executive committee, California Electragists, northern chapter, has been installed as president of the Sacramento Exchange Club.

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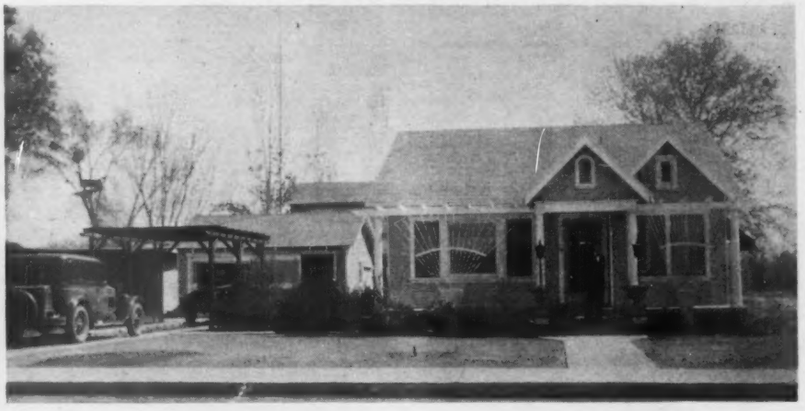
Estimable

CONTRARY to any conjecture, Mrs. P. R. Mactolf is not the Doll mentioned in the firm name, Mactolf-Doll, Electragists of Glendale, Calif., although one might be pardoned for thinking so. "Mac" himself is president of the Estimators' Section of Los Angeles and an all-around big man in the industry.

The Gartleys of Bakersfield



ONE of the most attractive small residences in Bakersfield is that of Eugene J. Gartley, Electragist of that city, proprietor of the Bakersfield Electric Company. There is built-in radio in each room, operated by a master switch. A thermostatic fire alarm is installed on his gas-fired furnace in case of backfire. De luxe fixtures, plenty of outlets, and three- and four-way switches wherever handy, make the use of light and appliances easy. A ¼-hp. motor-driven cooling system with a seven-minute air change is also installed. All services are underground; radio aerials are in duplicate, one on a pole on the roof of the storage and garage building, the other consisting of 180 ft. of lead armored cable laid underground.

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Symbolic

FRONT covers of "The Estimator," the official mimeographed publication of the Los Angeles Estimators' Section of the California Electragists, now carry a large emblem symbolic of the interests served by that group in the electrical construction industry. The symbol takes the shape of a wheel (reproduced above) the rim of which is depicted as the "wheel of progress of the electrical construction industry in Southern California." The hub of this wheel is shown as the Estimators' Section, revolving on the axle of the Electragists.

The spokes of the wheel represent the various co-operating groups which make the work of the Section complete. These include: Electrical contractors, architects and engineers, manufacturers and jobbers, underwriters' laboratories, electric utilities, telephone and telegraph companies, vocational schools and technical publishers, and city, state and insurance inspectors.

Each of these groups is represented at practically every Thursday noon meeting held by the Section during the year. The Section meetings have come to be regarded as a common meeting ground for the exchange of information and for transaction of business between the individuals and their companies; they prove in many respects a time-saver to all who take part. Each program is designed with a view to studying interesting and necessary field methods or theories in connection with electrical construction or the materials used in building.

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DISCUSSION OF ARTICLE 5, National Electrical Code, led by H. V. Dobson, Santa Barbara city electrician, and a description of a new southern California theater which uses a form of hydraulic remote control on dimmers and projection machines, featured the Jan. 23 meeting of the southern California chapter, Southwestern Section, I.A.E.I., in Los Angeles.

MITCHELL'S ELECTRIC SHOP, Oxnard, Calif., recently shipped its first panel to a foreign country as part of the equipment of a water pump sold to a concern in Palestine. This equipment will work on a German generation system of 350 volts, 50 cycles. A horseshoe shaped panel of the Zone Mutual Water Company at Somis, Calif., is another successful installation by this shop. This will be described in detail in a future issue.

ELDREDGE ELECTRIC SHOP, formerly at 704 Central Ave., Balboa Beach, Calif., has moved across the street to 701 Central Ave.

New Products

G. E. Washing Machines and Ironers

Electric washing machines and ironers have been announced by the merchandise department of the General Electric Company, Bridgeport, Conn. The new washing machines are featured by the "activator," by means of which effective washing action starts at the water level, and a

sturdy downward tug sweeps out air bubbles and pulls the clothes into the full-power washing zone at the tips of the blades of the "activator." The clothes are flexed by the blades, thereby loosening embedded dirt particles, and hot sudsy water is at the same time forced through the clothes. A circular roll-over movement of the clothes through the soapy water gives a continuous return to the full-power washing zone, with no twisting or braiding of the clothes and with the pieces constantly separated.

The new machines are full-skirted, and finished in two shades of harmonizing blue. Tubs are enameled porcelain, ripple finished. The mechanism, which is fully enclosed and protected, is easily accessible by removing the tub.

The machine is powered by a fully insulated, cradle mounted ¼-hp. motor, wick-fed from an oil reservoir.

Model W, wringer type, incorporates a new type of wringer, from which the extracted water flows through a special return drain to the tub, thus eliminating wet, slippery floors. Model C, extractor type, has the spinner basket set on the same post as the "activator," so that washing and drying can be carried on at one time. List price in the West of model W, $124.50; model C, $112.50.

Two types of G. E. ironers are offered. One is a portable or table model, and the other will fit the wringer post of any standard washer. The shoe is of rust-proof, stainless metal, highly polished so

as to give a smooth finish to all articles being ironed.

So that model R will harmonize with the model W washer, it is finished in the same blue as the washer with which it operates. The table model ironer is designated as model T. Both models have full open end roll. Western retail prices are $54.50 for model R; model T, $84.50.—ELECTRICAL WEST, Feb. 1, 1931.

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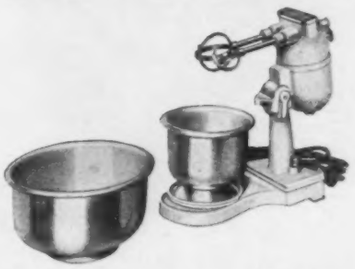
New Sunbeam Appliances

Three new appliances just introduced by the Chicago Flexible Shaft Company, Chicago, are the Sunbeam Mixmaster, Wafflewitch, and Toastwitch.

The motor of the Mixmaster has sufficient power to do all beating, whipping, stirring, and mixing jobs, no matter how heavy the mixture, and a lever in the base permits any degree of speed desired. Two highly finished metal bowls, one for small



quantities, the other for large, are included in the outfit. The bowls automatically rotate to facilitate mixing. Retail price, $24.75.

A bowl that may be tucked away underneath the waffle grids, and a ladel that holds exactly enough batter for a waffle, are part of the equipment of the Wafflewitch. The waffle grids as a unit are hinged to the post at the back, and when a waffle is required the grid part swings out to the right or left and opens up ready to receive the batter, while the bowl remains underneath. This feature makes the Wafflewitch especially desirable where table space is limited. Retail price, complete with bowl and ladel, $19.75.

Bread toasted in the Toastwitch need neither be watched nor turned, and need never be burned. When toasting is completed, the current is automatically cut off, the Toastwitch opens itself up, and raises up the front edge of the toast so that it can be picked off comfortably. The toaster is adjustable for light, medum or full brown toast, and will also toast two full-slice sandwiches, halved rolls, crackers, etc. Retail price, $17.50.

Both Wafflewitch and Toastwitch are chromium plated throughout. Western distributors are Sandoval Sales Company, San Francisco, and Federal Merchandise Company, Los Angeles.—ELECTRICAL WEST, Feb. 1, 1931.

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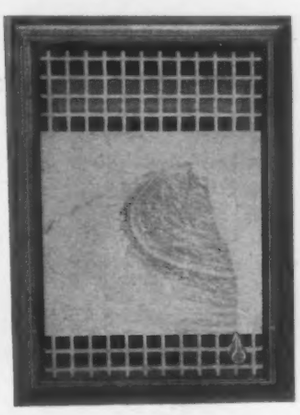
Fan-Type Heater

A fan-type electric heater, in which the heating coils are in the periphery of the fan which distributes and diffuses the air, is now being manufactured in the Wesix heater factories in San Francisco, Los Angeles, Seattle, and Birmingham, Ala. Particular care has been taken in designing this heater to avoid premature recirculation; an adjustable "Zonator" allows the heat to be easily directed to the "living zone," or to be circulated normally, depending upon the heating conditions desired.

Super-automatic control, with thermostats mounted integral with the heater, turns off the fan and part of the heater automatically when the room reaches normal temperature, and maintains the temperature of the room automatically with only a portion of the heater operating, the air being circulated by natural convection. Fan and coils are entirely enclosed, and back and frame remain cool when the heater is in operation, making it safe for use where there are children. Retail price of flush wall type without thermostat is $65; flush wall type with thermostat, $75; flush wall type super-automatic, $80. These prices apply to heaters rated at 4 kw. or less. Portable, bracket and floor types are also available.—ELECTRICAL WEST, Feb. 1, 1931.

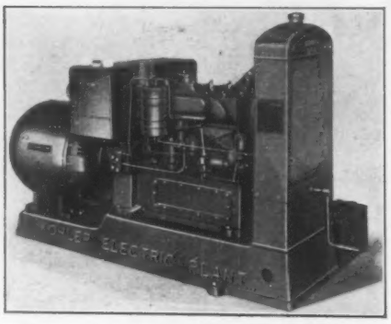


Full-automatic Alternator

A full-automatic alternator with inherent voltage regulation has been developed by the Kohler Company, of Kohler, Wis., to meet a need for an a.c. emergency plant which has arisen as a result of the increasing use of electrical equipment operating only on alternating current, such as X-ray machines, radio receivers, oil burners, and blowers.

In the Kohler 5-kva. and 10-kva. electric plants the field and armature windings are so placed that the exciter voltage is rapidly increased on heavier alternator loads. This inherent voltage regulation system is as rugged and dependable as any standard d.c. generator, according to the manufacturer.

Fully automatic, all control features of the system operate directly from the standard wiring system, whereby the plant operates only when there is work for it. Thus the plant may be used by one class of users for emergency use, as well as by another class which has no other source of power. No special wiring system is required and every switch button is automatically a remote control starting switch. —ELECTRICAL WEST, Feb. 1, 1931.



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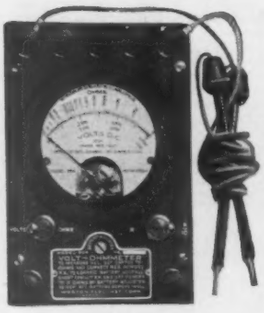
Rotary Converters

A complete line of rotary converters expressly designed to make possible the use of radio receiving sets, electric combination radio-phonographs, neon signs, ozone machines, X-ray apparatus, and similar appliances built to operate on 110-volt, 60-cycle alternating current, in localities where only direct current is available, is announced by Robbins & Myers Sales, Inc., Springfield, Ohio.

Silent, trouble-free performance, unusual durability, and absolute freedom from radio interference are characteristics claimed for the converters by the manufacturers. A foundation for smooth operation is formed by precision bearing design employing a wool yarn type lubrication system. A filtering device prevents any noises generated on the d.c. side of the converter from reaching the receiving set. Binding posts are conveniently located for easy installation in the line between the appliance and the source of power.

Model 106 illustrated has an output capacity of 125 watts.—ELECTRICAL WEST, Feb. 1, 1931.



Radio Volt-Ohmmeter

The equipment of Model 564 volt-ohmmeter recently announced by the Weston Electrical Instrument Corporation, Newark, N. J., consists of a 3¼-in. diameter meter with ranges of 3, 30, 300, and 600 volts and two resistance ranges of 0-10,000 and 0-100,000 ohms. Two toggle switches serve to connect the meter in circuit.

Over-all dimensions of the instrument are 5½ x 3⅝ in. x 2⅛ in. deep (excluding binding posts), and the weight is 2.3 lb. including the self-contained "C" battery.

While designed especially for voltage and resistance measurements and for checking the continuity of a circuit, this volt-ohmmeter may also be used to considerable advantage in radio laboratories when extreme accuracy is not of prime importance, according to the manufacturer. The list price of the instrument is $37.50.—ELECTRICAL WEST, Feb. 1, 1931.

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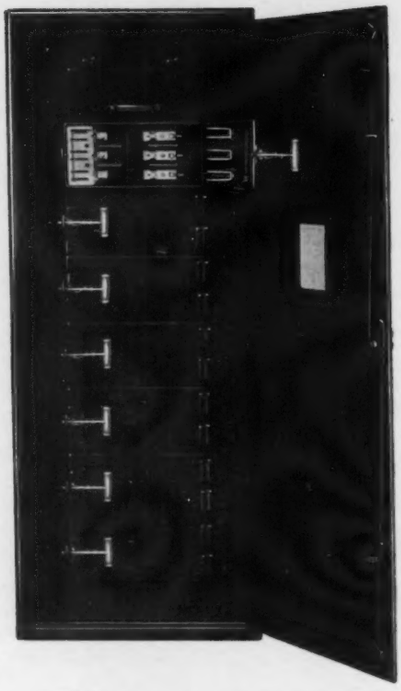
Wool-Packed Motor Bearings

The Bodine Electric Company, 2254 West Ohio St., Chicago, announces a new type N-5 fractional horsepower motor which will ultimately replace the older Bodine SA and SD motors. Two frame sizes are now in production, having the following ratings: 1/20 and 1/12 at 1125 r.p.m., 1/10 and 1/8 hp. at 1725 r.p.m.

The type N-5 frame is equipped with specially developed wool-packed bearings. Double oil slots at the sides of the bearings provide double contact areas for the wool packing on the motor shaft. Adequate lubrication without flooding of the bearing is obtained. A high-grade knitting yarn is packed around the non-freeze leaded bronze bearing. A tight dust cap makes a totally enclosed bearing; grit and dust are excluded.

Large ventilating ducts on the stator permit the use of a larger fan. The ventilation in the type N-5 is consequently superior to that of the SA and SD frames. The increase in ratings for a given frame size ranges from 15 to 30 per cent.—ELECTRICAL WEST, Feb. 1, 1931.



Safety Distribution Panel

A safety (dead front) distribution panel in which no live parts can possibly be touched even when the switch door is opened is announced by the Square D Company, Detroit, Mich. Opening the switch instantly disconnects all live parts and leaves the fuses accessible upon a fixed base, on which also is mounted the switch. The switch element provides at least 50 per cent over-load rupturing capacity without flashing over, breaking down or in any way being a hazard to the operator, according to the manufacturer. All poles are made or broken simultaneously, and any circuit may be killed by reversing the switch blades mounted on the door.—ELECTRICAL WEST, Feb. 1, 1931.

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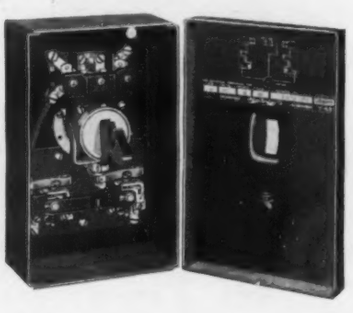
Hand-Operated Switch

A new hand-operated a.c. starting switch with overload breakers is announced by the Allen-Bradley Company, 1311 South First St., Milwaukee, Wis.

This new Bulletin No. 609 switch handles all motors up to 3 hp., 110 volts; 5 hp., 220 volts; and 7½ hp., 440-550 volts. Overload breakers operating on the soldered ratchet principle eliminate the maintenance of thermal plugs and fuses. They will interrupt any overload and are reset with a lever without opening the switch cover. The starting lever has a safety interlock which prevents the cover from being removed unless the lever is in "off" position. The switch can be padlocked in open position if required. Its simplicity of construction makes it available for many types of installation at a moderate price.—ELECTRICAL WEST, Feb. 1, 1931.



Portable Oil Testing Set

Apparatus just placed on the market by the American Transformer Company, 178 Emmet St., Newark, N. J., eliminates the necessity for removing samples of oil from transformer equipment in the field and taking these to a laboratory for testing. The AmerTran T-S-6A is an oil test set providing all the advantages of a laboratory, according to its manufacturer, and is of such size that it may be placed by one man in any passenger car and taken into the field. The tester consists of a transformer, voltmeter, potentiometer, circuit breaker, oil cup, pilot light, and power switch.—ELECTRICAL WEST, Feb. 1, 1931.

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Wall-Type Heater

A permanently installed wall-type electric heater that provides fan circulation of warm air throughout the room where it is in use is the Apex "Blo-Air" heater, made by the Apex Manufacturing Company, Emeryville, Calif.

Apex heaters are easy to install in either horizontal or upright position; the wiring is simple, and switches are conveniently installed at the top of the heater. Retail prices of four models range from $35 to $62.50; wattages range from 2,000 to 4,000 watts. Finishes are in brown crackle or statuary bronze. Western distributors are Sandoval Sales Company, San Francisco, and Apex Sales Company, Los Angeles.—ELECTRICAL WEST, Feb. 1, 1931.

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Box-frame Motors

Robbins & Myers, Inc., Springfield, Ohio, and Brantford, Ont., announce a new line of box-frame motors in sizes from ½ to 3 hp. Among their noteworthy features are the following: Compact, powerful construction; semi-enclosed end heads; and mounting dimensions on repulsion induction, single-phase, polyphase, and direct current types having similar ratings and speeds. An improved wool-yarn bearing lubrication system is standard, but ball bearing motors of identical types are built on special order.—ELECTRICAL WEST, Feb. 1, 1931.

Commutator Solderer

An electrically heated "Allatonce" commutator soldering machine has been added to its line of motor building devices by the P. E. Chapman Electrical Works, 1820 Chouteau Ave., St. Louis, Mo. The machine is equipped with an easily adjustable, clearly indicating, automatic temperature control. All segments of the commutator are soldered in one operation, thus speeding production.—ELECTRICAL WEST, Feb. 1, 1931.

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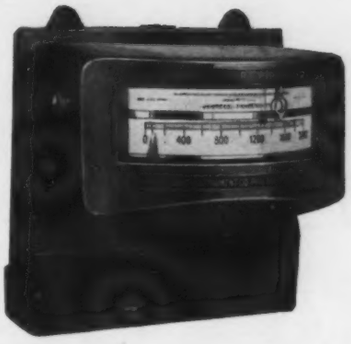

Pyrometer Controller

The new Model 801 indicating pyrometer controller illustrated can be supplied by The Brown Instrument Company, Philadelphia, as an automatic control pyrometer, resistance thermometer, tachometer, or CO_2 meter. Readings are observed directly on a 6-in. scale and the device is suitable for "on and off" or "three position" control through switches, valves, dampers, etc. The motor and all wiring terminals are enclosed, and a safety device is available which opens the furnace circuit if thermocouple or wiring fails.—ELECTRICAL WEST, Feb. 1, 1931.

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Radio Outlet

A one-gang outlet for aerial, ground, and power connections has been introduced by the Arrow Electric Division of The Arrow-Hart & Hegeman Electric Company, Hartford, Conn. All connections are plainly marked on the receptacle, but further to insure correct connections, the aerial and ground plug blades are set at an angle which prevents their insertion in the power slots of the receptacle. A divider plate keeps aerial-ground and power circuits separated in the wall box.—ELECTRICAL WEST, Feb. 1, 1931.

Trade Literature

¶ GROUNDING PRACTICE—Details of design and construction of the ground bus and auxiliary grounding parts are contained in a recent publication of the Burndy Engineering Company, Inc., New York, entitled "Principles of Grounding," which the company describes as the first attempt to present standardized manufactured equipment for general grounding practice. The booklet incorporates a catalog of connectors for the ground bus.

¶ PHOTOFLASH LAMP—A booklet whose purpose is to instruct the amateur photographer in the correct use of the Photoflash lamp has been issued by the sales promotion department of the National Lamp Works of the General Electric Company, Nela Park, Cleveland, Ohio.

¶ POWER PUMPS—Vertical triplex single-acting power pumps are described in a recent booklet of the Worthington Pump and Machinery Corporation, Harrison, N. J.

¶ METAL-CLAD SWITCHGEAR—The consolidation of two or more solenoid operated oil circuit breakers into one compact, steel-armored unit is described in the Dec. 15 issue of *The Delta Star*, published monthly by Delta-Star Electric Company, Chicago.

¶ ELECTROPLATING ALUMINUM—The process employed in the electroplating of aluminum is fully described in a booklet entitled "Electroplating Aluminum" recently issued by the Aluminum Company of America, Pittsburgh, Pa.

¶ SAFETY PANELS—A new bulletin on its convertible safety panels has just been issued by the Square D Company, Detroit.

¶ "INSULATION"—Under this title C. D. La Moree, with offices in Los Angeles, San Francisco, Phoenix, and Seattle, has issued a catalog of the products of the manufacturers whom he represents.

¶ PLANER MOTORS—Type T heavy-duty planer motors for reversing service are the subject of Bulletin No. 207 of the Reliance Electric & Engineering Company, Cleveland, Ohio.

¶ INSULATORS—Insulators for wood poles where guy wires are used are described in Publication No. 404H of the Ohio Brass Company, Mansfield, Ohio, entitled "O-B Wood Guy Strain Insulators."

¶ CONTROLLER EQUIPMENT—Catalog No. 4,000 is the third catalog section issued by The Bristol Company, Waterbury, Conn., on the subject of air operated control equipment, and is devoted to accessories made by The Bristol Company and other manufacturers for use with such equipment.

¶ LIGHTING FIXTURES—A catalog (No. 31) of its adjustable fixtures, portables, and daylight units has been issued by The O. C. White Company, Worcester, Mass.

¶ ELECTRIC TACHOMETERS—The Brown Instrument Company, Philadelphia, has ready for distribution catalog No. 46 covering indicating and recording tachometers in various models and the electric generators used in their operation.

¶ G. E. PUBLICATIONS—Recent publications of the General Electric Company, Schenectady, N. Y., include:

GEA-1305: Transformers for Luminous-tube Lighting.
GEA-1304: Thyrite Lightning Arresters.
GEA-962B: A-C Printing-Press Controllers.
GEA-1165: Type FKO-27 Outdoor Oil Circuit Breakers.
GEA-925B: Oil Circuit Breakers Types FK-, FKO-, FHK-, and FHKO-239.
GEA 1145A: Mechanical-Drive Turbines.
GEA-132: Phase Protective Panels.
GEA-1276: G.E. Fractional-Horsepower Motors.
GEA-716C: Type DT-3 Totalizing Relay.
GEA-1336: General-Purpose Squirrel-Cage Induction Motors, Type KF.
GEA-1266A: CR7505-A2 Photoelectric Relay.
GEA-1080A: Steam Turbines.
GEA-1011B: Steam Turbines.

Barometer

INDUSTRIAL activity in the Western states in December decreased 21.5 per cent compared with November, according to reports of electrical energy consumption by individual mills and factories. The drop is only slightly greater than in the two preceding years, and continues the level about 25 per cent below 1928 and 1929. The decrease is large compared with the 5 per cent decline in the country as a whole, but this is accounted for by seasonal factors, which are not the same in the West as elsewhere. In earlier months, when the national average was rapidly falling, the West continued on a high plane.

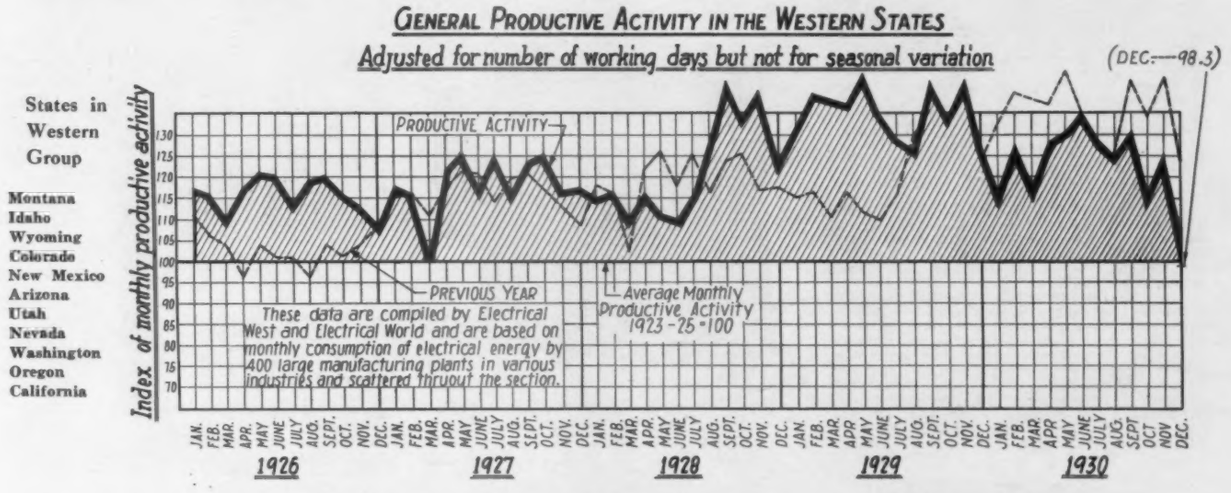
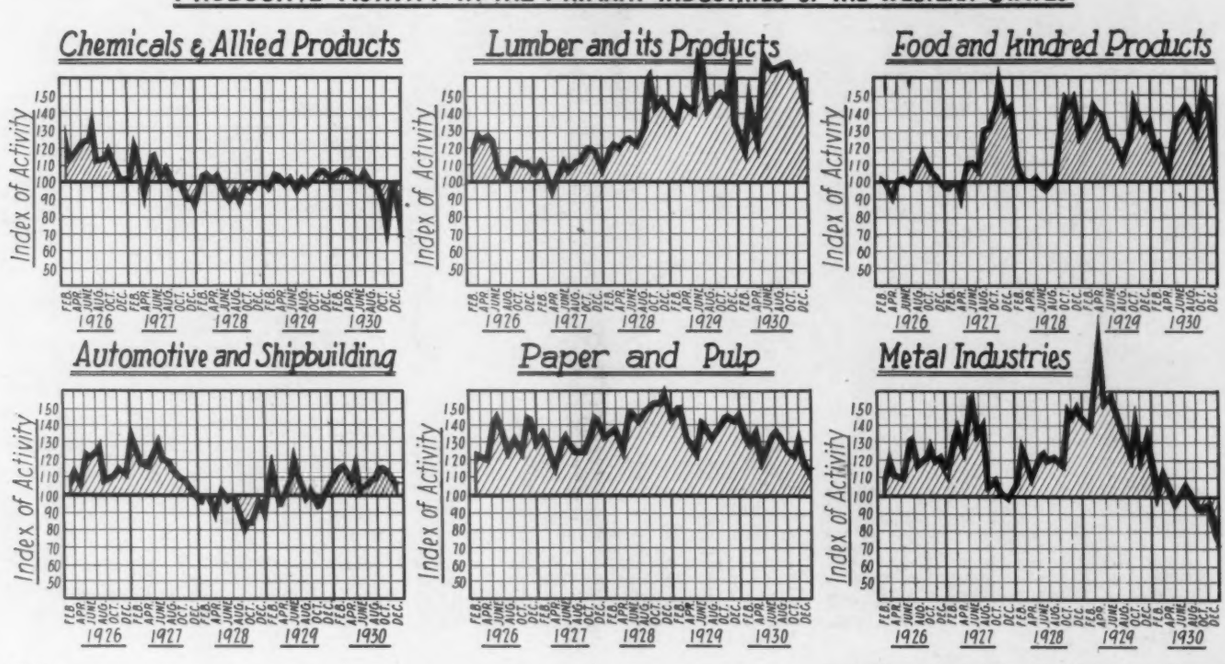
Most notable is the 40 per cent drop in activity in food industries. The decrease was general, though the index in part reflects an extremely severe reduction in the figures of one very large plant.

In the stone industry group the decrease is partly due to an abnormally high November figure. Compared with December the index is off 14 per cent. It reflects mainly conditions in cement manufacture.

Next to food, lumber most affects the regional index. This industry, after being almost constant since April, fell 12 per cent from November, but the drop was much smaller than in 1929 and the index is 10 per cent over December, 1929.

Least change is shown in the metals group, but partly because the drop came in November. Metals are 23 per cent below October and at the lowest point since the summer of 1924.

Indexes of Industrial Activity in the Western States
(All figures adjusted for number of working days)

	Dec. 1930	Nov. 1930	Dec. 1929	Av. 12 Months 1930	Av. 12 Months 1929
All industry	98.3	125.4*	126.0	123.2	135.5
Chemical and allied products	69.1	91.3	106.0	95.6	100.5
Food and kindred products	88.9	146.3	138.8	133.4	135.4
Forest products	146.0	166.8*	132.3	157.5	154.6
Metals group	71.3	78.0	121.0	95.1	146.3
Paper and pulp	115.9	122.8	150.3	130.0	143.2
Rubber and its products	105.5	123.1	100.0	151.4	172.2
Shipbuilding	.....	107.8	113.4	.....	104.3
Stone, clay and glass	89.3	126.0	102.9	102.5	136.3

* Revised.